As filed with the Securities and Exchange Commission on October 15, 2019

Registration No. 333-234020

# UNITED STATES
# SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

## AMENDMENT NO. 1
## TO
## FORM S-1
## REGISTRATION STATEMENT
## UNDER
## THE SECURITIES ACT OF 1933

# PHATHOM PHARMACEUTICALS, INC.

(Exact name of registrant as specified in its charter)

| Delaware | 2834 | 82-4151574 |
|---|---|---|
| (State or other jurisdiction of incorporation or organization) | (Primary Standard Industrial Classification Code Number) | (I.R.S. Employer Identification No.) |

2150 E. Lake Cook Road, Suite 800
Buffalo Grove, Illinois 60089
650-325-5156

(Address, including zip code, and telephone number, including area code, of registrant's principal executive offices)

David Socks
President and Chief Executive Officer
Phathom Pharmaceuticals, Inc.
2150 E. Lake Cook Road, Suite 800
Buffalo Grove, Illinois 60089
650-325-5156

(Name, address, including zip code, and telephone number, including area code, of agent for service)

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**Approximate date of commencement of proposed sale to the public:** As soon as practicable after this Registration Statement is declared effective.

If any of the securities being registered on this Form are to be offered on a delayed or continuous basis pursuant to Rule 415 under the Securities Act of 1933, check the following box. ☐

If this Form is filed to register additional securities for an offering pursuant to Rule 462(b) under the Securities Act, check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering. ☐

If this Form is a post-effective amendment filed pursuant to Rule 462(c) under the Securities Act, check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering. ☐

If this Form is a post-effective amendment filed pursuant to Rule 462(d) under the Securities Act, check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering. ☐

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, smaller reporting company or an emerging growth company. See the definitions of "large accelerated filer," "accelerated filer," "smaller reporting company," and "emerging growth company" in Rule 12b-2 of the Exchange Act.

Large accelerated filer ☐ Accelerated filer ☐

Non-accelerated filer ☒ Smaller reporting company ☒

Emerging growth company ☒

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 7(a)(2)(B) of the Securities Act. ☒

## CALCULATION OF REGISTRATION FEE

| Title of Each Class of Securities To Be Registered | Amount to be Registered[1] | Proposed Maximum Offering Price Per Share | Proposed Maximum Aggregate Offering Price[2] | Amount of Registration Fee[3] |
|---|---|---|---|---|
| Common Stock, $0.0001 par value per share | 9,085,000 shares | $20.00 | $181,700,000 | $23,585 |

(1) Includes 1,185,000 shares of common stock that the underwriters have the option to purchase.
(2) Estimated solely for the purpose of calculating the registration fee pursuant to Rule 457(a) under the Securities Act of 1933, as amended.
(3) $12,120 of this registration fee was previously paid by the Registrant in connection with the filing of its Registration Statement on Form S-1 on September 30, 2019.

**The Registrant hereby amends this Registration Statement on such date or dates as may be necessary to delay its effective date until the Registrant shall file a further amendment which specifically states that this Registration Statement shall thereafter become effective in accordance with Section 8(a) of the Securities Act of 1933 or until the Registration Statement shall become effective on such date as the Commission, acting pursuant to said Section 8(a), may determine.**

The information in this preliminary prospectus is not complete and may be changed. We may not sell these securities until the registration statement filed with the Securities and Exchange Commission is effective. This preliminary prospectus is not an offer to sell these securities and it is not soliciting an offer to buy these securities in any state or other jurisdiction where the offer or sale is not permitted.

Subject to Completion. Dated October 15, 2019.

# 7,900,000 Shares


## Common Stock

This is an initial public offering of shares of common stock of Phathom Pharmaceuticals, Inc. We are offering 7,900,000 shares of our common stock.

Prior to this offering, there has been no public market for our common stock. It is currently estimated that the initial public offering price per share will be between $18.00 and $20.00.

We have applied to list our common stock on the Nasdaq Global Market under the symbol “PHAT.”

We are an “emerging growth company” as defined under the federal securities laws and, as such, we have elected to comply with certain reduced public company reporting requirements for this prospectus and may elect to do so in future filings.

*See “Risk Factors” beginning on page 13 to read about factors you should consider before buying shares of our common stock.*

**Neither the Securities and Exchange Commission nor any other state securities commission has approved or disapproved of these securities or passed on the adequacy or accuracy of this prospectus. Any representation to the contrary is a criminal offense.**

| | Per Share | Total |
|---|---|---|
| Initial public offering price | $ | $ |
| Underwriting discount(1) | $ | $ |
| Proceeds, before expenses, to Phathom Pharmaceuticals, Inc. | $ | $ |

(1) See the section titled “Underwriting” for additional information regarding compensation payable to the underwriters.

To the extent that the underwriters sell more than 7,900,000 shares of common stock, the underwriters have the option to purchase up to an additional 1,185,000 shares from us at the initial price to the public less the underwriting discount.

The underwriters expect to deliver the shares against payment in New York, New York on , 2019.

**Goldman Sachs & Co. LLC** **Jefferies** **Evercore ISI**

**Needham & Company**

Prospectus dated , 2019.

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Neither we nor the underwriters have authorized anyone to provide you with information other than that contained in this prospectus or any free writing prospectus prepared by or on behalf of us or to which we have referred you. We and the underwriters take no responsibility for, and can provide no assurance as to the reliability of, any other information that others may give you. We and the underwriters are offering to sell, and seeking offers to buy, common stock only in jurisdictions where offers and sales are permitted. The information contained in this prospectus or any free writing prospectus is accurate only as of its date, regardless of its time of delivery or of any sale of shares of our common stock. Our business, financial condition, results of operations and prospects may have changed since that date.

For investors outside of the United States: We have not, and the underwriters have not, done anything that would permit this offering or possession or distribution of this prospectus in any jurisdiction where action for that purpose is required, other than the United States. Persons outside of the United States who come into possession of this prospectus must inform themselves about, and observe any restrictions relating to, the offering of the shares of common stock and the distribution of this prospectus outside of the United States.

## PROSPECTUS SUMMARY

*This summary highlights information contained elsewhere in this prospectus. This summary does not contain all of the information you should consider before investing in our common stock. You should read this entire prospectus carefully, especially the section titled "Risk Factors" and our combined financial statements and related notes included elsewhere in this prospectus, before making an investment decision. As used in this prospectus, unless the context otherwise requires, references to "we," "us," "our," "the Company," "Phathom Pharmaceuticals" and "Phathom" refer to Phathom Pharmaceuticals, Inc.*

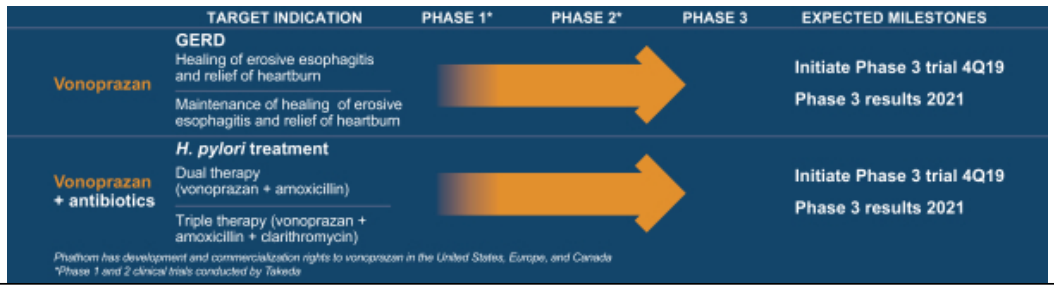
### Overview

We are a late clinical-stage biopharmaceutical company focused on developing and commercializing novel treatments for gastrointestinal, or GI, diseases. Our initial product candidate, vonoprazan, is an oral small molecule potassium competitive acid blocker, or P-CAB. P-CABs are a novel class of medicines that block acid secretion in the stomach. Vonoprazan has shown rapid, potent, and durable anti-secretory effects and has demonstrated clinical benefits over standard of care treatments as a single agent in the treatment of gastroesophageal reflux disease, or GERD, and in combination with antibiotics for the treatment of *Helicobacter pylori,* or *H. pylori,* infection. Takeda Pharmaceutical Company Limited, or Takeda, developed vonoprazan and has received marketing approval in nine countries in Asia and Latin America. Vonoprazan generated over $500 million in net sales in its fourth full year on the market since its approval in Japan in late 2014. In May 2019, we in-licensed the U.S., European, and Canadian rights to vonoprazan from Takeda.

We believe we can leverage Takeda's extensive clinical data, including results from 17 Phase 3 clinical trials, to advance vonoprazan through pivotal trials in the United States and Europe. We plan to initiate two pivotal Phase 3 clinical trials in the fourth quarter of 2019 for vonoprazan: one for the treatment of erosive GERD, also known as erosive esophagitis, and a second for the treatment of *H. pylori* infection. We expect to report top-line data from both trials in 2021. We believe that the successful completion of our Phase 3 clinical trials, together with the existing clinical data, will support regulatory submissions in 2021 and 2022 for marketing approval for the treatment of *H. pylori* infection and erosive esophagitis, respectively. In August 2019, we received qualified infectious disease product, or QIDP, designation from the U.S. Food and Drug Administration, or FDA, for vonoprazan in combination with certain antibiotics for the treatment of *H. pylori* infection which provides, among other benefits, extension of any regulatory exclusivity and potential eligibility for priority review. Vonoprazan has the potential to be the first gastric anti-secretory agent from a novel class approved in the United States, Europe, or Canada in over 30 years.

### Our Pipeline

The following chart summarizes our current development programs.



**Overview of Acid-Related GI Diseases**

GI diseases where treatment is related to acid control, such as GERD and *H. pylori* infection, are significant medical problems because of their high prevalence, chronic nature, and clinical sequelae. GERD results from the effects of acid on compromised mucosal defenses in the gastrointestinal tract. The reflux of gastric acid into the esophagus produces frequent and/or severe heartburn, indigestion, and reflux symptoms. Chronic GERD may damage esophageal tissue and progress to more severe diseases including erosive esophagitis, Barrett's esophagus, and esophageal cancer. In *H. pylori* infection, gastric acid limits the effectiveness of antibiotics used to eradicate infection. Chronic *H. pylori* infection can lead to dyspepsia, peptic ulcer disease, gastric cancer, and mucosa-associated lymphoid tissue (MALT) lymphoma.

GERD and *H. pylori* infection are two of the most common acid-related GI diseases and impact millions of people. The prevalence of GERD is estimated to be 20% of the U.S. population and 15% of the population in the five major countries in the European Union (France, Germany, Italy, Spain, and the United Kingdom, or the EU5). We estimate that there are approximately 65 million individuals in the United States and 50 million individuals in the EU5 with GERD. Approximately 30% of GERD patients have erosive esophagitis. *H. pylori* is a bacterial pathogen that infects approximately 35% of the U.S. population and 45% of the EU5 population. We estimate that there are approximately 115 million individuals in the United States and 145 million individuals in the EU5 infected with *H. pylori*.

**Current Standard of Care for GERD and *H. pylori***

Over the last thirty years, the proton pump inhibitor, or PPI, class, has been the standard of care for the treatment of acid-related GI diseases. PPIs are generally used as a single agent for the treatment of GERD and in combination with antibiotics for the treatment of *H. pylori* infection. The PPI class includes drugs such as Prilosec (omeprazole), Nexium (esomeprazole), and Prevacid (lansoprazole). Prior to the introduction of generic and over-the-counter, or OTC, alternatives, annual PPI class sales reached approximately $12.5 billion in the United States, and peak sales for individual brands were approximately $3.7 billion for Prilosec, $3.5 billion for Nexium, and $3.4 billion for Prevacid in the United States.

While PPIs are the current standard of care and have experienced significant commercial success, they have significant limitations that result in a large unmet medical need. In GERD, PPI therapy is suboptimal for many patients due to the slow onset and insufficient duration of acid control which can lead to inadequate symptom relief. Approximately 15% to 45% of GERD patients remain inadequately treated with PPIs. In the treatment of *H. pylori* infection, the standard of care consists of a combination of a PPI and at least two oral antibiotics. However, increasing antibiotic resistance has resulted in declining eradication rates with PPI-based therapy. We believe these unmet medical needs are in part driven by limitations associated with the mechanism of action and pharmacokinetics of PPIs.

Gastric acid is secreted by proton pumps that are expressed on the channeled surfaces of parietal cells in the stomach. Proton pumps are continuously synthesized and switch between active and inactive states in response to various stimuli, such as food. When activated, proton pumps increase acid secretion. PPIs reduce gastric acid secretion by irreversibly binding to and inhibiting active proton pumps expressed on the parietal cells. PPIs require activation by gastric acid, but they are unstable in the presence of acid. This instability, combined with the short circulating half-life of PPIs, limits their efficacy. Additionally, because proton pumps continuously switch between active and inactive states, multiple doses of PPIs are required to inhibit enough proton pumps to achieve a clinical benefit. As a result, PPIs have a relatively slow onset of action and limited potency and duration of

effect, which may result in patients experiencing only partial relief, increasing PPI dosage, and/or cycling through multiple PPIs seeking relief.

**Our Solution: Vonoprazan**

Vonoprazan has a differentiated mechanism of action from PPIs. Unlike PPIs, vonoprazan:

- does not require activation by gastric acid;
- is stable in the presence of acid;
- binds with a slow dissociation rate to both active and inactive proton pumps; and
- has a long plasma half-life that replenishes the drug at the site of action over the course of the day.

These factors have enabled vonoprazan to demonstrate more rapid and potent acid suppression versus the PPI esomeprazole in human subjects two hours after oral dosing and maintain target acid inhibition over a 24-hour period in a randomized, open-label, crossover clinical trial. In contrast, PPIs require three to five days to reach steady state acid suppression and do not reliably maintain target acid inhibition over a 24-hour period. In addition, vonoprazan demonstrated approximately 10-to-100-fold better acid control compared to esomeprazole.

We believe that vonoprazan's anti-secretory profile may demonstrate clinically meaningful advantages over PPIs, such as:

- faster, more complete, and more durable healing of erosive esophagitis;
- faster, more complete, and more durable control of GERD symptoms;
- higher *H. pylori* eradication rates in combination with antibiotics compared to standard of care triple therapy and the potential for antibiotic-sparing dual therapy; and
- more flexible dosing, including dosing independent of food and time of day, and the potential for rapid symptom relief through on-demand dosing.

Vonoprazan generated over $500 million in net sales in its fourth full year on the market in Japan, a 20% increase over the previous year.

**Vonoprazan Clinical Data**

Vonoprazan has demonstrated clinical advantages over PPIs in the treatment of erosive esophagitis and *H. pylori* infection in completed Phase 3 clinical trials conducted in Japan and other Asian countries.

**Erosive esophagitis.** In two Phase 3 clinical trials conducted in Japan assessing vonoprazan versus the PPI lansoprazole in the healing and maintenance of healing of erosive esophagitis, vonoprazan met its primary endpoint in demonstrating non-inferiority to lansoprazole. In a post hoc analysis of the healing trial, vonoprazan demonstrated faster healing and a superior overall healing rate compared to lansoprazole in patients with more severe erosive esophagitis. After two weeks of treatment, 88% of erosive esophagitis patients with more severe disease were healed after treatment with vonoprazan versus 64% with lansoprazole ($p=0.0008$). In the maintenance of healing trial, vonoprazan demonstrated lower recurrence rates of erosive esophagitis six months after treatment versus lansoprazole across all grades of severity of erosive esophagitis. Vonoprazan demonstrated a 2% recurrence rate compared to 17% for lansoprazole ($p<0.0001$).

***H. pylori*.** A Phase 3 clinical trial was conducted in Japan assessing vonoprazan in combination with the antibiotics amoxicillin and clarithromycin versus lansoprazole in combination with these same antibiotics in first line treatment of *H. pylori* infection. In this trial, the vonoprazan-based regimen met its primary endpoint in demonstrating a non-inferior eradication rate of 93% compared to 76% for lansoprazole-based regimen ($p<0.0001$) and was also superior in a post hoc analysis of this trial ($p<0.0001$). In patients who failed first line therapy, vonoprazan in combination with the antibiotics metronidazole and amoxicillin demonstrated a 98% eradication rate as second line therapy. A p-value is the probability that the reported result was achieved purely by chance, such that a p-value of less than or equal to 0.05 or 0.01 means that there is a 5.0% or 1.0% or less probability, respectively, that the difference between the control group and the treatment group is purely due to chance. A p-value of 0.05 or less typically represents a statistically significant result.

**Safety.** As of December 2018, 6,683 subjects have been exposed to vonoprazan in completed and ongoing Phase 1 to 3 clinical trials. The doses studied have ranged from 1 to 120 mg with durations up to one year. The most commonly reported adverse events, or AEs, in the clinical development program for vonoprazan, as reflected in the Japanese prescribing information published by Japan's Pharmaceuticals and Medical Devices Agency, were diarrhea, constipation, nausea, elevated liver enzymes, rash, and eosinophilia. All such events had an incidence rate of less than 5.0%, other than diarrhea in the treatment of *H. pylori* which had an incidence rate of 10.6% in combination with antibiotics. No dose-related increase in treatment-emergent AEs, or TEAEs, or serious AEs, or SAEs, was observed. The safety profile of vonoprazan and incidence of TEAEs, drug-related TEAEs, and TEAEs leading to drug discontinuation were similar between vonoprazan and lansoprazole across studies.

The most recent post-marketing safety report from December 2018 includes an estimated 23 million patients who have received vonoprazan in Japan since its launch. Based on the post-marketing experience, the clinically significant adverse reactions section of the Japanese prescribing information for vonoprazan was updated to include skin reactions such as toxic epidermal necrolysis, Steven-Johnson syndrome, and erythema multiforme. The incidence of these skin reactions was considered extremely rare (less than 1 in 100,000 patients) and a causal relationship to vonoprazan could not be ruled out. We believe the overall post-marketing safety and tolerability profile of vonoprazan has been consistent with that observed in clinical trials.

**Our Strategy**

Our goal is to be a leader in the development and commercialization of novel treatments for GI diseases. Our strategy is initially focused on developing and commercializing vonoprazan as a potential first-in-class P-CAB in the United States, Europe, and Canada for the treatment of acid-related GI diseases. Key elements of this strategy include:

- ***Advance the clinical development of vonoprazan in erosive esophagitis and H. pylori infection and seek marketing approval.*** We believe we can leverage the existing clinical data and post-marketing experience, as well as our management team's experience with vonoprazan, to advance vonoprazan through a single pivotal Phase 3 clinical trial in each of erosive esophagitis and *H. pylori* infection beginning in the fourth quarter of 2019, and we expect to report top-line data from both trials in 2021.
- ***Commercialize vonoprazan in the United States.*** We plan to independently commercialize vonoprazan, if approved, in the United States by building a leading specialty gastroenterology commercial infrastructure to support the adoption of vonoprazan.

- ***Seek commercial partnerships to maximize the vonoprazan opportunity outside of the United States***. We believe there is a significant commercial opportunity for vonoprazan in Europe and Canada. To address these markets, we plan to seek one or more partners with existing commercial infrastructure and expertise in these markets.
- ***Expand the development of vonoprazan across indications, dosing regimens, and alternative formulations and packaging***. We plan to pursue vonoprazan lifecycle extension strategies in areas with clear unmet need, clinical rationale, and commercial justification. These strategies may include additional indications, flexible dosing regimens, and alternative formulations and packaging.
- ***In-license or acquire additional clinical or commercial stage product candidates for the treatment of GI diseases in a capital efficient manner***. We intend to take advantage of our management team's GI expertise to opportunistically in-license or acquire additional innovative therapies for diseases treated by gastroenterologists.

**Our Team**

Our founders and management team have deep expertise in developing GI therapeutics, including anti-secretory agents, and direct experience developing vonoprazan at Takeda. Our Chairman, Tadataka (Tachi) Yamada, M.D., is the former Chief Medical Officer and Chief Scientific Officer at Takeda. He is the former President of the American Gastroenterological Association and former Chief of Gastroenterology and Internal Medicine at the University of Michigan. Our Chief Executive Officer, David Socks, is the former Chief Executive Officer of Outpost Medicine, LLC, a GI and urology focused company. Mr. Socks was also President and Chief Operating Officer of Incline Therapeutics Inc. through its sale to The Medicines Company in 2013, and Senior Vice President, Corporate Development and Strategy of Cadence Pharmaceuticals, Inc. Azmi Nabulsi, M.D., M.P.H., our Chief Operating Officer, is the former Deputy Chief Medical and Scientific Officer at Takeda. Our Head of Regulatory, Tom Harris, is the former Senior Vice President and Head of Global Regulatory at Takeda. Dr. Yamada, Dr. Nabulsi, and Mr. Harris were extensively involved with the development of vonoprazan at Takeda. Our investors include Frazier Healthcare Partners, Medicxi, RA Capital Management, Abingworth, certain accounts managed by Janus Henderson Investors and BVF Partners LP.

As part of a planned transition, we expect that Terrie Curran, a member of our board of directors, will succeed Mr. Socks as Chief Executive Officer effective upon the closing of the acquisition of her current employer, Celgene Corporation, by Bristol-Myers Squibb Company. Ms. Curran has served as President, Global Inflammation and Immunology (I&I) Franchise and as a member of the Executive Committee at Celgene since 2017. Ms. Curran joined Celgene in 2013 as the U.S. Commercial Head of the I&I Franchise and built the capabilities and recruited the teams that executed the launch of OTEZLA. Following Ms. Curran's appointment as CEO, Mr. Socks will serve as interim Chief Financial Officer and continue to serve as a member of our board of directors.

**Financial Update**

We estimate that our cash and cash equivalents were approximately $74.5 million as of September 30, 2019. This amount is unaudited and preliminary and is subject to completion of financial closing procedures. As a result, this amount may differ from the amount that will be reflected in our financial statements as of and for the quarter ended September 30, 2019. Our financial statements for the quarter ended September 30, 2019 will not be available until after this offering is completed, and consequently will not be available to you prior to investing in this offering.

**Risks Related to Our Business**

Our ability to execute our business strategy is subject to numerous risks, as more fully described in the section titled "Risk Factors" immediately following this Prospectus Summary. These risks include, among others:

- We have a limited operating history, have incurred significant operating losses since our inception and expect to incur significant losses for the foreseeable future. We may never generate any revenue or become profitable or, if we achieve profitability, we may not be able to sustain it.
- We will require substantial additional financing to achieve our goals, and a failure to obtain this necessary capital when needed on acceptable terms, or at all, could force us to delay, limit, reduce or terminate our product development programs, commercialization efforts or other operations.
- We currently depend entirely on the success of vonoprazan, which is our only product candidate. Our assumptions about vonoprazan's development and commercial potential are based in large part on the development, including data from clinical trials conducted by Takeda and independent investigators, and commercial experience of vonoprazan in Japan and other Asian countries, which data the FDA or comparable foreign regulatory authorities may not accept to support approval. If we are unable to advance vonoprazan in clinical development, obtain regulatory approval and ultimately commercialize vonoprazan, or experience significant delays in doing so, our business will be materially harmed.
- We rely on our license agreement with Takeda to provide us rights to develop and commercialize vonoprazan in the United States, Europe, and Canada. If the license agreement is terminated, we would lose our rights to develop and commercialize vonoprazan.
- Clinical drug development involves a lengthy and expensive process with an uncertain outcome, and the results of prior clinical trials and other investigator-initiated clinical trials of vonoprazan are not necessarily predictive of our future results. Vonoprazan may not have favorable results in our clinical trials, or receive regulatory approval on a timely basis, if at all.
- Any difficulties or delays in the commencement or completion, or termination or suspension, of our planned clinical trials could result in increased costs to us, delay or limit our ability to generate revenue and adversely affect our commercial prospects.
- We intend to enroll patients in Europe in both of our planned Phase 3 clinical trials. However, the FDA and other comparable foreign regulatory authorities may not accept data from such trials, in which case our clinical development plans will be delayed, which could materially harm our business.
- We rely on third parties to conduct some or all aspects of our product manufacturing, research and preclinical and clinical testing, and these third parties may not perform satisfactorily.
- We face significant competition, and if our competitors develop technologies or product candidates more rapidly than we do or their technologies are more effective, our ability to develop and successfully commercialize products may be adversely affected.
- Our success depends on our ability to protect our intellectual property and our proprietary technologies.
- After this offering, our executive officers, directors, and principal stockholders, if they choose to act together, will continue to have the ability to control or significantly influence all matters submitted to stockholders for approval. Furthermore, many of our current directors were appointed by our principal stockholders.

## Corporate Information

We were originally incorporated under the laws of the state of Delaware on January 9, 2018 under the name North Bridge IV, Inc. On March 13, 2019, we changed our name to Phathom Pharmaceuticals, Inc. and merged YamadaCo IIA, Inc., a Delaware corporation, with and into our company, with Phathom Pharmaceuticals, Inc. as the surviving entity, or the Merger. References throughout this registration statement to Phathom Pharmaceuticals, Inc. include North Bridge IV, Inc. prior to the Merger. Our principal executive offices are located at 2150 E. Lake Cook Road, Suite 800, Buffalo Grove, Illinois 60089, and our telephone number is 650-325-5156. Our website address is www.phathompharma.com. The information contained in, or accessible through, our website does not constitute part of this prospectus. We have included our website address as an inactive textual reference only.

We use our pending trademark Phathom Pharmaceuticals in this prospectus. This prospectus also includes trademarks, tradenames, and service marks that are the property of other organizations. Solely for convenience, trademarks and tradenames referred to in this prospectus appear without the ® and ™ symbols, but those references are not intended to indicate, in any way, that we will not assert, to the fullest extent under applicable law, our rights or that the applicable owner will not assert its rights, to these trademarks and tradenames.

## Presentation of Japanese Sales Numbers

All Japanese sales numbers presented in this prospectus are shown in U.S. dollars based on the June 30, 2019 conversion ratio of 0.009 yen to one dollar.

## Implications of Being an Emerging Growth Company and a Smaller Reporting Company

As a company with less than $1.07 billion in revenue during our last fiscal year, we qualify as an “emerging growth company” as defined in the Jumpstart Our Business Startups Act of 2012, or the JOBS Act. An emerging growth company may take advantage of reduced reporting requirements that are otherwise applicable to public companies. These provisions include, but are not limited to:

- being permitted to provide only two years of audited financial statements, in addition to any required unaudited interim financial statements, with correspondingly reduced “Management’s Discussion and Analysis of Financial Condition and Results of Operations” disclosure;
- not being required to comply with the auditor attestation requirements of Section 404 of the Sarbanes-Oxley Act of 2002, as amended, or Sarbanes-Oxley Act;
- not being required to comply with any requirement that may be adopted by the Public Company Accounting Oversight Board regarding mandatory audit firm rotation or a supplement to the auditor’s report providing additional information about the audit and the financial statements, unless the SEC determines the new rules are necessary for protecting the public;
- reduced disclosure obligations regarding executive compensation; and
- exemptions from the requirements of holding a nonbinding advisory vote on executive compensation and stockholder approval of any golden parachute payments not previously approved.

We may take advantage of these provisions until the last day of our fiscal year following the fifth anniversary of the date of the first sale of our common equity securities pursuant to an effective

registration statement under the Securities Act of 1933, as amended, or the Securities Act, which such fifth anniversary will occur in 2024. However, if certain events occur prior to the end of such five-year period, including if we become a “large accelerated filer” as defined in Rule 12b-2 under the Securities Exchange Act of 1934, or the Exchange Act, our annual gross revenues exceed $1.07 billion or we issue more than $1.0 billion of non-convertible debt in any three-year period, we will cease to be an emerging growth company prior to the end of such five-year period.

We have elected to take advantage of certain of the reduced disclosure obligations in this prospectus and in the registration statement of which this prospectus is a part and may elect to take advantage of other reduced reporting requirements in future filings. As a result, the information in this prospectus and that we provide to our stockholders in the future may be different than what you might receive from other public reporting companies in which you hold equity interests.

In addition, the JOBS Act provides that an emerging growth company can take advantage of an extended transition period for complying with new or revised accounting standards. We have irrevocably elected not to avail ourselves of this exemption and, therefore, we will be subject to the same new or revised accounting standards as other public companies that are not emerging growth companies.

We are also a smaller reporting company as defined in the Exchange Act. We may continue to be a smaller reporting company even after we are no longer an emerging growth company. We may take advantage of certain of the scaled disclosures available to smaller reporting companies and will be able to take advantage of these scaled disclosures for so long as our voting and non-voting common stock held by non-affiliates is less than $250.0 million measured on the last business day of our second fiscal quarter, or our annual revenue is less than $100.0 million during the most recently completed fiscal year and our voting and non-voting common stock held by non-affiliates is less than $700.0 million measured on the last business day of our second fiscal quarter.

**The Offering**

| | |
|---|---|
| Common stock offered by us | 7,900,000 shares. |
| Underwriters' option to purchase additional shares from us | The underwriters have a 30-day option to purchase up to a total of 1,185,000 additional shares of our common stock. |
| Common stock to be outstanding immediately after this offering | 25,883,458 shares (27,068,458 shares if the underwriters exercise their option to purchase additional shares of common stock in full). |
| Use of proceeds | We intend to use the net proceeds of this offering to fund the clinical development of vonoprazan and for working capital and general corporate purposes, including pre-commercial activities. See "Use of Proceeds." |
| Risk factors | See "Risk Factors" and other information included in this prospectus for a discussion of factors you should consider carefully before deciding to invest in our common stock. |
| Directed share program | At our request, the underwriters have reserved up to 3.0% of the shares of common stock to be offered by this prospectus for sale, at the initial public offering price, to certain of our directors, officers, employees, and their friends and family members through a directed share program. If these persons purchase reserved shares, this will reduce the number of shares available for sale to the general public. Any reserved shares that are not so purchased will be offered by the underwriters to the general public on the same terms as the other shares offered by this prospectus. |
| Proposed Nasdaq Global Market symbol | "PHAT" |

The number of shares of our common stock to be outstanding after this offering set forth above is based on 17,983,458 shares of our common stock outstanding as of June 30, 2019, including 4,657,250 shares subject to forfeiture or our right of repurchase, and gives effect to the automatic conversion of $90.3 million of aggregate principal amount, plus accrued interest thereon, of convertible promissory notes we issued in May 2019, or the May 2019 Notes, into an aggregate of 6,106,940 shares of our common stock immediately prior to the closing of this offering (based on an assumed initial public offering price of $19.00 per share, the midpoint of the price range set forth on the cover page of this prospectus, and assuming the conversion occurs on October 28, 2019), and excludes:

- 7,588,000 shares of common stock issuable to Takeda upon the exercise of an outstanding warrant, or the Takeda Warrant, as of June 30, 2019, at an exercise price of $0.00004613 per share;

- 1,400,528 shares of common stock issuable upon exercise of stock options granted after June 30, 2019, at a weighted-average exercise price of $9.10 per share;
- 2,700,000 shares of common stock reserved for future issuance under our 2019 Equity Incentive Plan, or the 2019 Plan, which will become effective in connection with this offering (which number does not include any potential evergreen increases pursuant to the terms of the 2019 Plan);
- 270,000 shares of common stock reserved for future issuance under our 2019 Employee Stock Purchase Plan, or ESPP, which will become effective in connection with this offering (which number does not include any potential evergreen increases pursuant to the terms of the ESPP); and
- 16,446 shares of common stock which may become issuable to the lenders under our loan and security agreement, or the Loan Agreement, upon the exercise of warrants outstanding as of June 30, 2019, or the Lender Warrants, at an exercise price of $15.20 per share (based on an assumed initial public offering price of $19.00 per share, the midpoint of the price range set forth on the cover page of this prospectus), which warrants will only become exercisable if and when we borrow an additional $25.0 million under our Loan Agreement.

Unless otherwise indicated, all information contained in this prospectus assumes or gives effect to:

- the filing and effectiveness of our amended and restated certificate of incorporation and the adoption of our amended and restated bylaws, each of which will occur immediately prior to the closing of this offering;
- the issuance of 6,106,940 shares of common stock upon the automatic conversion of the May 2019 Notes immediately prior to the closing of this offering (based on an assumed initial public offering price of $19.00 per share, the midpoint of the price range set forth on the cover page of this prospectus, and assuming the conversion occurs on October 28, 2019);
- the expiration of the right granted to Takeda to receive an additional common stock warrant, or the Takeda Warrant Right, upon the closing of this offering (based on an assumed initial public offering price of $19.00 per share, the midpoint of the price range set forth on the cover of this prospectus, as further described below in the section titled “Management’s Discussion and Analysis of Financial Condition and Results of Operations—Overview—License Agreement with Takeda”);
- a 1,559.1183-for-1 forward stock split of our common stock effected on March 13, 2019;
- a subsequent 2.168-for-1 forward stock split of our common stock, which we effected on October 11, 2019;
- no exercise of the outstanding options or warrants described above; and
- no exercise by the underwriters of their option to purchase 1,185,000 additional shares of our common stock.

A $1.00 increase in the assumed initial public offering price of $19.00 per share, the midpoint of the price range set forth on the cover page of this prospectus, would decrease the number of shares of our common stock issued upon conversion of the May 2019 Notes by 305,346 shares. A $1.00 decrease in the assumed initial public offering price of $19.00 per share would increase the number of shares of our common stock issued upon conversion of the May 2019 Notes by 339,275 shares.

## Summary Combined Financial Data

The following tables set forth a summary of our historical combined financial data as of, and for the periods ended on, the dates indicated. The combined financial statements include the accounts of our company and YamadaCo IIA, Inc., both of which were entities under common control prior to the Merger. We have derived the summary combined statements of operations data for the year ended December 31, 2018 from our audited combined financial statements included elsewhere in this prospectus. We have derived the summary combined statements of operations data for the six months ended June 30, 2018 and 2019 and the summary combined balance sheet data as of June 30, 2019 from our unaudited combined financial statements included elsewhere in this prospectus. The unaudited combined financial statements have been prepared on a basis consistent with our audited combined financial statements included in this prospectus and, in the opinion of management, reflect all adjustments, consisting only of normal recurring adjustments, necessary to fairly state our results of operations for the six months ended June 30, 2018 and 2019 and financial position as of June 30, 2019. You should read these data together with our combined financial statements and related notes included elsewhere in this prospectus and the sections titled “Selected Combined Financial Data” and “Management’s Discussion and Analysis of Financial Condition and Results of Operations.” Our historical results for any prior period are not necessarily indicative of our future results.

| (in thousands, except share and per share data) | Year Ended December 31, 2018 | Six Months Ended June 30, 2018 | Six Months Ended June 30, 2019 |
|---|---|---|---|
| | | (unaudited) | |
| **Combined Statements of Operations Data:** | | | |
| Operating expenses: | | | |
| Research and development | $ 20 | $ – | $ 3,201 |
| In-process research and development | – | – | 78,897 |
| General and administrative (includes related party amounts of $321, $124 and $18, respectively) | 1,205 | 506 | 2,142 |
| Total operating expenses | 1,225 | 506 | 84,240 |
| Loss from operations | (1,225) | (506) | (84,240) |
| Other income (expense): | | | |
| Interest income | – | – | 101 |
| Interest expense (includes related party amounts of $(13), $(4) and $(82), respectively) | (13) | (4) | (1,148) |
| Change in fair value of warrant liabilities (includes related party amounts of $0, $0 and $(1,277), respectively) | – | – | (1,284) |
| Change in fair value of convertible promissory notes (includes related party amounts of $(50), $(4) and $(502), respectively) | (50) | (4) | (2,442) |
| Total other income (expense) | (63) | (8) | (4,773) |
| Net loss | $ (1,288) | $ (514) | $ (89,013) |
| Net loss per share, basic and diluted[(1)] | $ (0.21) | $ (0.10) | $ (13.40) |
| Weighted-average shares of common stock outstanding, basic and diluted[(1)] | 6,051,675 | 5,331,270 | 6,640,394 |
| Pro forma net loss per share, basic and diluted (unaudited)[(1)] | $ (0.20) | | $ (9.85) |
| Pro forma weighted-average shares of common stock outstanding, basic and diluted (unaudited)[(1)] | 6,098,429 | | 8,578,296 |

(1) See Note 1 to our combined financial statements included elsewhere in this prospectus for an explanation of the method used to calculate the historical and pro forma net loss per share, basic and diluted, and the number of shares used in the computation of the per share amounts.

| (in thousands) | As of June 30, 2019 | | |
|---|---|---|---|
| | Actual (unaudited) | Pro Forma[1][3] (unaudited) | Pro Forma As Adjusted[2][3] (unaudited) |
| **Combined Balance Sheet Data:** | | | |
| Cash and cash equivalents | $ 82,917 | $ 82,917 | $219,710 |
| Working capital (deficit)[4] | (60,210) | 82,520 | 219,650 |
| Total assets | 84,879 | 84,879 | 221,335 |
| Convertible promissory notes payable at fair value (including accrued interest) | 93,559 | – | – |
| Warrant liabilities | 49,597 | 426 | 426 |
| Long-term debt, including final payment fee and net of debt discount | 24,512 | 24,512 | 24,512 |
| Accumulated deficit | (90,301) | (90,301) | (90,301) |
| Total stockholders' equity (deficit) | (84,385) | 58,345 | 195,138 |

(1) Gives effect to the (i) automatic conversion of the May 2019 Notes into an aggregate of 6,106,940 shares of our common stock immediately prior to the closing of this offering (based on an assumed initial public offering price of $19.00 per share, the midpoint of the price range set forth on the cover page of this prospectus, and assuming the conversion occurs on October 28, 2019), and (ii) the reclassification of the Takeda Warrant to stockholders' equity (deficit).

(2) Gives effect to (i) the pro forma adjustments set forth in footnote (1) above, and (ii) the issuance and sale of 7,900,000 shares of our common stock in this offering at the assumed initial public offering price of $19.00 per share, the midpoint of the price range set forth on the cover page of this prospectus, after deducting the estimated underwriting discounts and commissions and estimated offering expenses payable by us. Each $1.00 increase (decrease) in the assumed initial public offering price of $19.00 per share would increase (decrease) the pro forma as adjusted amount of each of our cash and cash equivalents, working capital, total assets and total stockholders' equity (deficit) by approximately $7.3 million, assuming that the number of shares offered by us, as set forth on the cover page of this prospectus, remains the same and after deducting the estimated underwriting discounts and commissions and estimated offering expenses payable by us. Each increase (decrease) of 1.0 million shares in the number of shares offered by us at the assumed initial public offering price of $19.00 per share would increase (decrease) the pro forma as adjusted amounts of each of our cash and cash equivalents, working capital, total assets and total stockholders' equity (deficit) by approximately $17.7 million, after deducting the estimated underwriting discounts and commissions and estimated offering expenses payable by us.

(3) The pro forma and pro forma as adjusted information discussed above is illustrative only and will be adjusted based on the actual initial public offering price and other terms of our initial public offering determined at pricing.

(4) We define working capital (deficit) as current assets less current liabilities. See our combined financial statements included elsewhere in this prospectus for further details regarding our current assets and current liabilities.

## RISK FACTORS

*Investing in our common stock involves a high degree of risk. You should consider carefully the risks and uncertainties described below, together with all of the other information in this prospectus, including our combined financial statements and related notes included elsewhere in this prospectus and the section titled "Management's Discussion and Analysis of Financial Condition and Results of Operations" before making an investment decision. If any of the following risks are realized, our business, financial condition, results of operations and prospects could be materially and adversely affected. In that event, the trading price of our common stock could decline and you could lose part or all of your investment.*

### Risks Related to Our Limited Operating History, Financial Position and Capital Requirements

***We have a limited operating history, have incurred significant operating losses since our inception and expect to incur significant losses for the foreseeable future. We may never generate any revenue or become profitable or, if we achieve profitability, we may not be able to sustain it.***

Biopharmaceutical product development is a highly speculative undertaking and involves a substantial degree of risk. We are a late clinical-stage biopharmaceutical company with a limited operating history upon which you can evaluate our business and prospects. We commenced operations in 2018, and to date, we have focused primarily on organizing and staffing our company, business planning, raising capital, in-licensing our initial product candidate, vonoprazan, meeting with regulatory authorities, and preparing for our planned Phase 3 clinical trials of vonoprazan. As a company, we have not yet demonstrated an ability to successfully complete any clinical trials, obtain regulatory approvals, manufacture a commercial scale product or arrange for a third party to do so on our behalf, or conduct sales and marketing activities necessary for successful product commercialization. Consequently, any predictions made about our future success or viability may not be as accurate as they could be if we had a history of successfully developing and commercializing biopharmaceutical products.

We have incurred significant operating losses since our inception. If vonoprazan is not successfully developed and approved in the United States, Europe and/or Canada, we may never generate any revenue. Our net losses were $1.3 million and $89.0 million for the year ended December 31, 2018 and the six months ended June 30, 2019, respectively. As of June 30, 2019, we had an accumulated deficit of $90.3 million. Substantially all of our losses have resulted from expenses incurred in connection with in-licensing and developing vonoprazan and from general and administrative costs associated with our operations. Vonoprazan and any future product candidates will require substantial additional development time and resources before we will be able to apply for or receive regulatory approvals and begin generating revenue from product sales. We expect to continue to incur losses for the foreseeable future, and we anticipate these losses will increase substantially as we continue our development of, seek regulatory approval for, and potentially commercialize vonoprazan and seek to identify, assess, acquire, in-license, or develop additional product candidates.

To become and remain profitable, we must succeed in developing and eventually commercializing products that generate significant revenue. This will require us to be successful in a range of challenging activities, including completing clinical trials and preclinical studies of vonoprazan and any future product candidates, obtaining regulatory approval for these product candidates and manufacturing, marketing and selling any products. We are only in the preliminary stages of most of these activities. We may never succeed in these activities and, even if we do, may never generate revenues that are significant enough to achieve profitability. In addition, we have not yet demonstrated an ability to successfully overcome many of the risks and uncertainties frequently encountered by

companies in new and rapidly evolving fields, particularly in the biopharmaceutical industry. Because of the numerous risks and uncertainties associated with biopharmaceutical product development, we are unable to accurately predict the timing or amount of increased expenses or when, or if, we will be able to achieve profitability. Even if we do achieve profitability, we may not be able to sustain or increase profitability on a quarterly or annual basis. Our failure to become and remain profitable would depress the value of our company and could impair our ability to raise capital, expand our business, continue our product development efforts, diversify our product candidate pipeline or even continue our operations. A decline in the value of our company could also cause you to lose all or part of your investment.

***We will require substantial additional financing to achieve our goals, and a failure to obtain this necessary capital when needed on acceptable terms, or at all, could force us to delay, limit, reduce or terminate our product development programs, commercialization efforts or other operations.***

The development of biopharmaceutical product candidates is capital-intensive. We expect our expenses to increase in connection with our ongoing activities, particularly as we conduct our planned Phase 3 clinical trials of vonoprazan and seek regulatory approval for vonoprazan. In addition, if vonoprazan receives approval and is commercialized, we will be required to make milestone and royalty payments to Takeda, from whom we have in-licensed the rights to develop and commercialize vonoprazan in the United States, Europe, and Canada pursuant to the license agreement, dated May 7, 2019, between us and Takeda, or the Takeda License. Furthermore, if and to the extent we seek to acquire or in-license additional product candidates in the future, we may be required to make significant upfront payments, milestone payments, and/or licensing payments. If we obtain regulatory approval for vonoprazan or any future product candidate, we also expect to incur significant commercialization expenses related to product manufacturing, marketing, sales and distribution. Because the outcome of any clinical trial is highly uncertain, we cannot reasonably estimate the actual amounts necessary to successfully complete the development and commercialization of vonoprazan or any future product candidate. Furthermore, following the completion of this offering, we expect to incur additional costs associated with operating as a public company. Accordingly, we will need to obtain substantial additional funding in connection with our continuing operations. If we are unable to raise capital when needed or on attractive terms, we could be forced to delay, reduce or eliminate our research and development programs or any future commercialization efforts.

We believe that the net proceeds from this offering, together with our existing cash and cash equivalents, will enable us to fund our operations for at least the next 24 months. In particular, we expect that the net proceeds from this offering will allow us to complete our planned Phase 3 clinical trials of vonoprazan in the treatment of erosive esophagitis and *H. pylori* infection. We have based these estimates on assumptions that may prove to be wrong, and we could use our capital resources sooner than we currently expect. Our operating plans and other demands on our cash resources may change as a result of many factors currently unknown to us, and we may need to seek additional funds sooner than planned, through public or private equity or debt financings or other capital sources, including potentially collaborations, licenses and other similar arrangements. In addition, we may seek additional capital due to favorable market conditions or strategic considerations even if we believe we have sufficient funds for our current or future operating plans. Attempting to secure additional financing may divert our management from our day-to-day activities, which may adversely affect our ability to develop vonoprazan or any future product candidates.

Our future capital requirements will depend on many factors, including:

- the initiation, type, number, scope, results, costs and timing of, our clinical trials of vonoprazan, and preclinical studies or clinical trials of other potential product candidates we may choose to pursue in the future, including feedback received from regulatory authorities;

- the costs and timing of manufacturing for vonoprazan or any future product candidates, including commercial scale manufacturing if any product candidate is approved;
- the costs, timing and outcome of regulatory review of vonoprazan or any future product candidates;
- the costs of obtaining, maintaining and enforcing our patents and other intellectual property rights;
- our efforts to enhance operational systems and hire additional personnel to satisfy our obligations as a public company, including enhanced internal controls over financial reporting;
- the costs associated with hiring additional personnel and consultants as our business grows, including additional executive officers, clinical development personnel and commercial personnel;
- the timing and amount of the milestone or other payments we must make to Takeda and any future licensors;
- the costs and timing of establishing or securing sales and marketing capabilities if vonoprazan or any future product candidate is approved;
- our ability to achieve sufficient market acceptance, coverage and adequate reimbursement from third-party payors and adequate market share and revenue for any approved products;
- patients' willingness to pay out-of-pocket for any approved products in the absence of coverage and/or adequate reimbursement from third-party payors;
- the terms and timing of establishing and maintaining collaborations, licenses and other similar arrangements; and
- the costs associated with any products or technologies that we may in-license or acquire.

Conducting clinical trials and preclinical studies is a time consuming, expensive, and uncertain process that takes years to complete, and we may never generate the necessary data or results required to obtain regulatory approval and achieve product sales. In addition, vonoprazan and other potential product candidates, if approved, may not achieve commercial success. Our commercial revenues, if any, would initially be derived from sales of vonoprazan, which we do not expect to be commercially available in our licensed territories for many years, if at all.

Accordingly, we will need to continue to rely on additional financing to achieve our business objectives. Adequate additional financing may not be available to us on acceptable terms, or at all. In addition, we may seek additional capital due to favorable market conditions or strategic considerations, even if we believe we have sufficient funds for our current or future operating plans.

***Raising additional capital may cause dilution to our stockholders, including purchasers of common stock in this offering, restrict our operations or require us to relinquish rights to our technologies or product candidates.***

Until such time, if ever, as we can generate substantial product revenues, we expect to finance our cash needs through equity offerings, our loan and security agreement, or the Loan Agreement, with Silicon Valley Bank, or SVB, as administrative and collateral agent, and lenders SVB and WestRiver Innovation Lending Fund VIII, L.P., or WestRiver, debt financings, or other capital sources, including potential collaborations, licenses and other similar arrangements. To the extent that we raise additional capital through the sale of equity or convertible debt securities, your ownership interest will be diluted, and the terms of these securities may include liquidation or other preferences that adversely affect your rights as a common stockholder. Our Loan Agreement includes, and any future debt financing and

preferred equity financing, if available, may involve agreements that include covenants limiting or restricting our ability to take specific actions, such as incurring additional debt, making capital expenditures or declaring dividends.

If we raise funds through future collaborations, licenses and other similar arrangements, we may have to relinquish valuable rights to our future revenue streams, research programs or product candidates or grant licenses on terms that may not be favorable to us and/or that may reduce the value of our common stock.

***Our management, as of December 31, 2018, and our independent registered public accounting firm, in their report on our combined financial statements as of and for the fiscal year ended December 31, 2018, have concluded that there is substantial doubt as to our ability to continue as a going concern.***

Our audited combined financial statements for the fiscal year ended December 31, 2018 were prepared assuming that we will continue as a going concern. The going concern basis of presentation assumes that we will continue in operation for the foreseeable future and will be able to realize our assets and satisfy our liabilities in the normal course of business and do not include any adjustments to reflect the possible future effects on the recoverability and classification of assets or amounts and classification of liabilities that may result from our inability to continue as a going concern. As of December 31, 2018, our management concluded that, based on our expected operating losses, negative cash flows and maturities of outstanding convertible promissory notes, there is substantial doubt about our ability to continue as a going concern for the twelve months after the date the combined financial statements were issued. Our ability to continue as a going concern is subject to our ability to obtain sufficient financing. If we cannot continue as a going concern, we may have to liquidate our assets and may receive less than the value at which those assets are carried on our combined financial statements, and it is likely that our stockholders may lose some or all of their investment in us. After this offering, we may not raise the funding we require such that substantial doubt about our ability to continue as a going concern continues. If we seek additional financing to fund our business activities in the future and there remains substantial doubt about our ability to continue as a going concern, investors or other financing sources may be unwilling to provide additional funding on commercially reasonable terms or at all.

**Risks Related to the Development and Regulatory Approval of Product Candidates**

***We currently depend entirely on the success of vonoprazan, which is our only product candidate. If we are unable to advance vonoprazan in clinical development, obtain regulatory approval and ultimately commercialize vonoprazan, or experience significant delays in doing so, our business will be materially harmed.***

We currently only have one product candidate, vonoprazan, which we in-licensed from Takeda. Our business presently depends entirely on our ability to successfully develop, obtain regulatory approval for, and commercialize vonoprazan in a timely manner. This may make an investment in our company riskier than similar companies that have multiple product candidates in active development that may be able to better sustain failure of a lead product candidate. We plan to initiate two pivotal Phase 3 clinical trials in the fourth quarter of 2019 for vonoprazan: one for the treatment of erosive esophagitis, and a second for the treatment of *H. pylori* infection. Our assumptions about vonoprazan's development and commercial potential are based in large part on the development and commercial experience of vonoprazan in Japan and other Asian countries. However, our assumptions may prove to be wrong, and we may encounter a materially and adversely different development and commercial experience. The success of vonoprazan will depend on several factors, including the following:

- acceptance by the FDA or by comparable foreign regulatory authorities of our proposed design of the planned Phase 3 clinical trials of vonoprazan and any future clinical trials;
- successful enrollment in clinical trials and completion of clinical trials with favorable results;
- the willingness of the FDA, the European Medicines Agency, or EMA, and other comparable foreign regulatory authorities to accept the data from our planned Phase 3 clinical trials conducted in Europe and preclinical studies and clinical trials conducted outside of our licensed territories by Takeda and independent investigators as part of the basis for review and approval of vonoprazan;
- demonstrating safety and efficacy to the satisfaction of applicable regulatory authorities;
- the outcome, timing and cost of meeting regulatory requirements established by the FDA, EMA, and other comparable foreign regulatory authorities;
- receipt of marketing approvals from applicable regulatory authorities, including one or more new drug applications, or NDAs, from the FDA and maintaining such approvals;
- making arrangements with Takeda or any future third-party manufacturers for, or establishing, commercial manufacturing capabilities and receiving/importing commercial supplies approved by FDA and other regulators from Takeda or any future third-party manufacturer;
- establishing sales, marketing and distribution capabilities and commercializing vonoprazan, if approved, whether alone or in collaboration with others;
- establishment and maintenance of patent and trade secret protection or regulatory exclusivity for vonoprazan;
- maintaining an acceptable safety profile of vonoprazan following approval; and
- maintaining and growing an organization of people who can develop and, if approved, commercialize, market, and sell vonoprazan to physicians, patients, healthcare payors, and others in the medical community.

The success of our business, including our ability to finance our company and generate any revenue in the future, will primarily depend on the successful development, regulatory approval and commercialization of vonoprazan, which may never occur. We have not yet succeeded and may not succeed in demonstrating efficacy and safety for vonoprazan in clinical trials or in obtaining marketing approval thereafter. It may be several years, if at all, before we have demonstrated the safety and

efficacy of a treatment sufficient to warrant approval for commercialization. If we are unable to develop, or obtain regulatory approval for, or, if approved, successfully commercialize vonoprazan, we may not be able to generate sufficient revenue to continue our business.

***Clinical drug development involves a lengthy and expensive process with an uncertain outcome, and the results of prior clinical trials and other investigator-initiated clinical trials of vonoprazan are not necessarily predictive of our future results. Vonoprazan may not have favorable results in our clinical trials, or receive regulatory approval on a timely basis, if at all.***

Clinical drug development is expensive and can take many years to complete, and its outcome is inherently uncertain. Our clinical trials may not be conducted as planned or completed on schedule, if at all, and failure can occur at any time during the preclinical study or clinical trial process. Despite promising preclinical or clinical results, any product candidate can unexpectedly fail at any stage of preclinical or clinical development. The historical failure rate for product candidates in our industry is high.

The results from clinical trials or preclinical studies of a product candidate may not predict the results of later clinical trials of the product candidate, and interim results of a clinical trial are not necessarily indicative of final results. Product candidates in later stages of clinical trials may fail to show the desired safety and efficacy characteristics despite having progressed through preclinical studies and initial clinical trials. In particular, while vonoprazan has been studied in an extensive clinical program by Takeda, including 17 Phase 3 clinical trials, we do not know how vonoprazan will perform in future clinical trials, including as a result of differences between the clinical trials conducted to date by Takeda or other third parties and our planned Phase 3 clinical trial designs. These differences include, among other things: including higher doses of antibiotics and longer duration of treatment and inclusion of a dual therapy arm in our planned Phase 3 clinical trial for the treatment of *H. pylori* infection, and conducting a single Phase 3 clinical trial for both the healing and maintenance of erosive esophagitis, rather than two separate trials. Further, the large majority of the clinical development of vonoprazan was conducted in Asian subjects, who naturally have differences in height, weight, drug metabolism, and potentially, acid-secretory capacity from Western populations. Although there are data across two Phase 1 clinical trials in healthy volunteers showing that the vonoprazan pharmacokinetic and pharmacodynamic profile is similar in Japanese and non-Japanese subjects, our clinical trials of vonoprazan in a broader population comprised of patients in the United States and Europe may not yield the same results as prior clinical trials. Additionally, Western patients may be more likely to deviate from clinical trial protocols or drop out of clinical trials than Japanese patients, which may negatively impact the results of our clinical trials. Further, in our planned Phase 3 clinical trial for the treatment of *H. pylori* infection, the vonoprazan dual therapy arm will not be double-blinded because patients in this arm will be administered amoxicillin three times daily, versus twice daily for the triple therapy regimens. Both triple therapy regimens will be double-blinded. The inability to double-blind the dual therapy arm may impact the results of this trial and how regulatory agencies or healthcare payors interpret such results. For example, the EMA has noted that it expects additional analyses of treatment compliance and drop-out rates in the dual therapy arm because it will not be double-blinded.

A number of companies in the pharmaceutical and biotechnology industries have suffered significant setbacks in clinical development even after the product candidate achieved promising results in earlier clinical trials. The results of our planned trials may not be comparable to those achieved previously, whether as a result of differences in trial design, patient population or otherwise.

Further, the FDA, the EMA, or other comparable foreign regulatory authorities may not view the data from clinical trials conducted by Takeda and other third parties discussed above, together with our single planned Phase 3 clinical trial in each of erosive esophagitis and *H. pylori* infection, as sufficient to support the regulatory approval of vonoprazan for the treatment of erosive esophagitis or *H. pylori* infection. The FDA, EMA, or other comparable foreign regulatory authorities may also disagree with the

adequacy of our trial designs, including as a result of the differences between our designs and those of Takeda's Phase 3 clinical trials discussed above. As a result, we could be required to conduct additional clinical trials prior to seeking and obtaining regulatory approval and our planned development timeline could materially change. In addition, in July 2019, we received scientific advice from the EMA on our planned Phase 3 clinical trial of vonoprazan in the healing and maintenance of healing of erosive esophagitis. For the healing phase of the study, the EMA recommended that we include an endoscopy to assess healing at Week 4 in addition to the planned endoscopies at Week 2 and Week 8 because the summary of product characteristics for lansoprazole suggests four weeks of treatment to assess healing in erosive esophagitis. We have decided not to incorporate this change into the study design given the additional burden on study subjects to return for a third endoscopy in an eight-week period. This decision may impact the future summary of product characteristics for vonoprazan or may cause the EMA to require us to conduct additional clinical trials for vonoprazan to support marketing approval.

In addition, Takeda, a third party over which we have no control, has the right to develop and commercialize vonoprazan outside of the United States, Europe, and Canada. Takeda has marketing approval for vonoprazan in certain countries in Asia and Latin America, and Takeda has ongoing clinical trials of vonoprazan in certain indications that we are also pursuing. If such ongoing trials fail to meet their primary endpoints, have serious adverse events or encounter other problems, the development potential of vonoprazan could be materially and adversely affected. In addition, if serious adverse events or other problems occur with patients using vonoprazan marketed outside of our licensed territories, or if the results of ongoing or future clinical trials of vonoprazan conducted by Takeda or others generate negative results or results that conflict with the results of our clinical trials, the FDA, EMA, or other regulatory authorities may delay, limit, or deny approval of vonoprazan, require us to conduct additional clinical trials as a condition to marketing approval, or withdraw their approval of vonoprazan or otherwise restrict our ability to market and sell vonoprazan, if approved. In addition, treating physicians may be less willing to prescribe vonoprazan due to concerns over such trial results or adverse events, which would limit our ability to commercialize vonoprazan.

For the foregoing reasons, our planned clinical trials may not be successful. Any safety concerns observed in any one of our clinical trials in our targeted indications could limit the prospects for regulatory approval of vonoprazan or any future product candidates in those and other indications, which could have a material adverse effect on our business, financial condition and results of operations.

***Any difficulties or delays in the commencement or completion, or termination or suspension, of our planned clinical trials could result in increased costs to us, delay or limit our ability to generate revenue and adversely affect our commercial prospects.***

Before obtaining marketing approval from regulatory authorities for the sale of vonoprazan or any future product candidates, we must conduct extensive clinical trials to demonstrate the safety and efficacy of vonoprazan or any future product candidates in humans. In August 2019, we submitted three separate INDs to the FDA for vonoprazan: one for erosive esophagitis; a second for dual therapy treatment of *H. pylori* infection; and a third for triple therapy treatment of *H. pylori* infection. These three INDs were accepted by the FDA in September 2019. We plan to initiate two pivotal Phase 3 clinical trials in the fourth quarter of 2019 for vonoprazan: one for the treatment of erosive esophagitis and a second for the treatment of *H. pylori* infection.

We will have to submit the results of preclinical studies to the FDA along with other information, including information about product candidate chemistry, manufacturing and controls and our proposed clinical trial protocol, as part of an IND for any future product candidates that we advance to clinical

development, and we may also be required to submit regulatory filings to foreign regulatory authorities to the extent we initiate clinical trials outside of the United States.

We do not know whether our planned trials will begin on time or be completed on schedule, if at all. The commencement and completion of clinical trials can be delayed for a number of reasons, including delays related to:

- the FDA, EMA or comparable foreign regulatory authorities disagreeing as to the design or implementation of our clinical trials and reaching consensus among the FDA and EMA over the design of the same clinical trial;
- any failure or delay in obtaining regulatory authorizations to commence a trial;
- any failure or delay in reaching an agreement with contract research organizations, or CROs, and clinical trial sites, the terms of which can be subject to extensive negotiation and may vary significantly among different CROs and trial sites;
- institutional review boards, or IRBs, refusing to approve, suspending or terminating the trial at an investigational site, precluding enrollment of additional subjects, or withdrawing their approval of the trial;
- changes to clinical trial protocols;
- clinical sites deviating from trial protocols or dropping out of a trial;
- manufacturing or obtaining sufficient quantities of vonoprazan and any future product candidates and obtaining sufficient quantities of lansoprazole, which will be used in both of our planned Phase 3 clinical trials, and/or antibiotics for use in clinical trials, including amoxicillin and clarithromycin, which will be used in our planned Phase 3 clinical trial of vonoprazan for the treatment of *H. pylori* infection;
- subjects failing to enroll or remain in our trials at the rate we expect, or failing to return for post- treatment follow-up;
- subjects choosing an alternative treatment for the indication for which we are developing vonoprazan and any future product candidates, or participating in competing clinical trials;
- lack of adequate funding to continue the clinical trial;
- subjects experiencing severe or unexpected drug-related adverse effects;
- occurrence of serious adverse events in trials of the same class of agents conducted by other companies;
- selection of clinical endpoints that require prolonged periods of clinical observation or analysis of the resulting data;
- a facility manufacturing vonoprazan or any future product candidates or any of their components being ordered by the FDA or comparable foreign regulatory authorities to temporarily or permanently shut down due to violations of current good manufacturing, or cGMP, regulations or other applicable requirements, or infections or cross-contaminations of product candidates in the manufacturing process;
- any changes to our manufacturing process that may be necessary or desired;
- third-party clinical investigators losing the licenses or permits necessary to perform our clinical trials, not performing our clinical trials on our anticipated schedule or consistent with the clinical trial protocol, good clinical practices, or GCP, or other regulatory requirements;
- third-party contractors not performing data collection or analysis in a timely or accurate manner; or

- third-party contractors becoming debarred or suspended or otherwise penalized by the FDA or other government or regulatory authorities for violations of regulatory requirements, in which case we may need to find a substitute contractor, and we may not be able to use some or all of the data produced by such contractors in support of our marketing applications.

We could also encounter delays if a clinical trial is suspended or terminated by us, by the IRBs of the institutions in which such trials are being conducted or by the FDA or comparable foreign regulatory authorities. Such authorities may impose such a suspension or termination due to a number of factors, including failure to conduct the clinical trial in accordance with regulatory requirements or our clinical protocols, inspection of the clinical trial operations or trial site by the FDA or comparable foreign regulatory authorities, unforeseen safety issues or adverse side effects, failure to demonstrate a benefit from using a drug, changes in governmental regulations or administrative actions or lack of adequate funding to continue the clinical trial. In addition, changes in regulatory requirements and policies may occur, and we may need to amend clinical trial protocols to comply with these changes. Amendments may require us to resubmit our clinical trial protocols to IRBs for reexamination, which may impact the costs, timing, or successful completion of a clinical trial.

Further, conducting clinical trials in foreign countries, as we may do for vonoprazan or any future product candidates, presents additional risks that may delay completion of our clinical trials. These risks include the failure of enrolled patients in foreign countries to adhere to clinical protocol as a result of differences in healthcare services or cultural customs, managing additional administrative burdens associated with foreign regulatory schemes, as well as political and economic risks relevant to such foreign countries.

Moreover, principal investigators for our clinical trials currently serve and may continue to serve as scientific advisors or consultants to us from time to time and receive compensation in connection with such services. Under certain circumstances, we may be required to report some of these relationships to the FDA or comparable foreign regulatory authorities. The FDA or comparable foreign regulatory authority may conclude that a financial relationship between us and a principal investigator has created a conflict of interest or otherwise affected interpretation of the clinical trial. The FDA or comparable foreign regulatory authority may therefore question the integrity of the data generated at the applicable clinical trial site and the utility of the clinical trial itself may be jeopardized. This could result in a delay in approval, or rejection, of our marketing applications by the FDA or comparable foreign regulatory authority, as the case may be, and may ultimately lead to the denial of marketing approval of vonoprazan or any future product candidates.

If we experience delays in the completion of, or termination of, any clinical trial of vonoprazan or any future product candidates, the commercial prospects of vonoprazan and any future product candidates will be harmed, and our ability to generate product revenues from any of these product candidates will be delayed. Moreover, any delays in completing our clinical trials will increase our costs, slow down our product candidate development and approval process and jeopardize our ability to commence product sales and generate revenues.

In addition, many of the factors that cause, or lead to, termination or suspension of, or a delay in the commencement or completion of, clinical trials may also ultimately lead to the denial of regulatory approval of a product candidate. We may make formulation or manufacturing changes to vonoprazan or any future product candidates, in which case we may need to conduct additional preclinical studies to bridge our modified product candidates to earlier versions. Any delays to our clinical trials that occur as a result could shorten any period during which we may have the exclusive right to commercialize vonoprazan or any future product candidates and our competitors may be able to bring products to market before we do, and the commercial viability of vonoprazan and any future product candidates could be significantly reduced. Any of these occurrences may harm our business, financial condition, and prospects significantly.

***We may find it difficult to enroll patients in our clinical trials. If we encounter difficulties enrolling patients in our clinical trials, our clinical development activities could be delayed or otherwise adversely affected.***

We may not be able to initiate or continue clinical trials for vonoprazan or any future product candidates if we are unable to identify and enroll a sufficient number of eligible patients to participate in these trials as required by the FDA or similar regulatory authorities outside the United States. Subject enrollment, a significant factor in the timing of clinical trials, is affected by many factors including the size and nature of the patient population, the proximity of patients to clinical sites, the eligibility and exclusion criteria for the trial, the design of the clinical trial, the risk that enrolled patients will not complete a clinical trial, our ability to recruit clinical trial investigators with the appropriate competencies and experience, competing clinical trials and clinicians' and patients' perceptions as to the potential advantages and risks of the product candidate being studied in relation to other available therapies, including any new drugs that may be approved for the indications we are investigating as well as any drugs under development. We will be required to identify and enroll a sufficient number of patients for each of our clinical trials. Potential patients for any planned clinical trials may not be adequately diagnosed or identified with the diseases which we are targeting or may not meet the entry criteria for such trials. For example, a key secondary analysis in our planned Phase 3 clinical trial for the treatment of *H. pylori* infection is the eradication rate in clarithromycin-resistant patients. However, because the process of assessing antibiotic resistance to *H. pylori* takes several weeks, we believe it is not practical to use resistance as an enrollment criteria in our clinical trial. Therefore, the percentage of clarithromycin-resistant patients enrolled in this clinical trial is unpredictable and may affect the results of the trial. We also may encounter difficulties in identifying and enrolling patients with a stage of disease appropriate for our planned clinical trials and monitoring such patients adequately during and after treatment. For example, in our Phase 3 clinical trial of vonoprazan in erosive esophagitis, we intend for 30% of the patients to have Los Angeles Class C or D erosive esophagitis, which are the most severe forms of erosive esophagitis and are estimated to only represent approximately 10 to 20% of erosive esophagitis patients. We may not be able to initiate or continue clinical trials if we are unable to locate a sufficient number of eligible patients to participate in the clinical trials required by the FDA or comparable foreign regulatory authorities. In addition, the process of finding and diagnosing patients may prove costly as these patients are required to undergo an endoscopy before being diagnosed as having Los Angeles Class C or D erosive esophagitis.

The timing of our clinical trials depends, in part, on the speed at which we can recruit patients to participate in our trials, as well as completion of required follow-up periods. The eligibility criteria of our clinical trials, once established, will further limit the pool of available trial participants. If patients are unwilling to participate in our trials for any reason, including the existence of concurrent clinical trials for similar patient populations, if they are unwilling to enroll in a clinical trial with a placebo-controlled design or the availability of approved therapies, or we otherwise have difficulty enrolling a sufficient number of patients, the timeline for recruiting patients, conducting trials and obtaining regulatory approval of vonoprazan and any future product candidates may be delayed. Our inability to enroll a sufficient number of patients for any of our future clinical trials would result in significant delays or may require us to abandon one or more clinical trials altogether.

Our assumptions used in determining expected clinical trial timelines may not be correct, and we may experience delays in enrollment, which would result in the delay of completion of such trials beyond our expected timelines.

***Use of vonoprazan or any future product candidates could be associated with side effects, adverse events or other properties or safety risks, which could delay or preclude approval, cause us to suspend or discontinue clinical trials, abandon a product candidate, limit the commercial profile of an approved label or result in other significant negative consequences that could severely harm our business, prospects, operating results and financial condition.***

As is the case with pharmaceuticals generally, it is likely that there may be side effects and adverse events associated with vonoprazan's or any future product candidates' use. Results of our clinical trials could reveal a high and unacceptable severity and prevalence of side effects or unexpected characteristics. Undesirable side effects caused by vonoprazan and any future product candidates could cause us or regulatory authorities to interrupt, delay or halt clinical trials and could result in a more restrictive label or the delay or denial of regulatory approval by the FDA or comparable foreign regulatory authorities. The drug-related side effects could affect patient recruitment or the ability of enrolled patients to complete the trial or result in potential product liability claims. Any of these occurrences may harm our business, financial condition, and prospects significantly.

Moreover, if vonoprazan or any other future product candidates are associated with undesirable side effects in clinical trials or have characteristics that are unexpected, we may elect to abandon their development or limit their development to more narrow uses or subpopulations in which the undesirable side effects or other characteristics are less prevalent, less severe or more acceptable from a risk-benefit perspective, which may limit the commercial expectations for the product candidate, if approved. We may also be required to modify our study plans based on findings in our clinical trials.

As of December 2018, 6,683 subjects have been exposed to vonoprazan in completed and ongoing Phase 1 to 3 clinical trials. The doses studied have ranged from 1 to 120 mg with durations up to one year. The most commonly reported AEs in the clinical development program for vonoprazan, as reflected in the Japanese prescribing information published by Japan's Pharmaceutical and Medical Devices Agency, or PMDA, were diarrhea, constipation, nausea, elevated liver enzymes, rash, and eosinophilia. All such events had an incidence rate of less than 5.0% other than diarrhea in the treatment of *H. pylori* which had an incidence rate of 10.6% in combination with antibiotics. No dose-related increase in TEAEs or SAEs was observed. The safety profile of vonoprazan and incidence of TEAEs, drug-related TEAEs, and TEAEs leading to drug discontinuation were similar between vonoprazan and lansoprazole across studies.

Certain earlier generation P-CABs previously under development by other companies may have been discontinued in part due to their hepatic safety profile. These hepatic safety concerns may be compound-specific and not generalizable to the P-CAB class. Vonoprazan has had a similar hepatic safety profile to lansoprazole across all clinical studies conducted by Takeda, in which 1.0% of subjects treated with vonoprazan 10 mg or 20 mg and 0.8% of subjects treated with lansoprazole 15 mg or 30 mg had ALT or AST elevations greater than three times the upper limit of normal or bilirubin elevations greater than two times the upper limit of normal.

The most recent post-marketing safety report from December 2018 includes an estimated 23 million patients who have received vonoprazan in Japan since launch. Based on the post-marketing experience, the clinically significant adverse reactions section of the Japanese prescribing information for vonoprazan was updated to include skin reactions such as toxic epidermal necrolysis, Steven-Johnson syndrome, and erythema multiforme. The incidence of these skin reactions was considered extremely rare (less than 1 in 100,000 patients) and a causal relationship to vonoprazan could not be ruled out.

Serious hepatic adverse events have also been observed among patients exposed to vonoprazan in Japan in the post-marketing setting. These cases were typically confounded by comorbidities or

other concomitant medications and are believed to be idiosyncratic reactions. The incidence of these events was considered extremely rare (less than 1 in 100,000 patients). The post-marketing safety data, including the December 2018 post-marketing safety report and the reported hepatic safety events, have been submitted to the PMDA. To date, there have been no changes to the Japan prescribing information related to hepatic safety. We may also observe hepatic-related events in our clinical trials.

It is possible that as we test vonoprazan and any future product candidates in our clinical trials, or as the use of vonoprazan and any future product candidates becomes more widespread if they receive regulatory approval, illnesses, injuries, discomforts and other adverse events that were observed in earlier trials, as well as conditions that did not occur or went undetected in previous trials, will be reported by patients. If such side effects become known later in development or upon approval, if any, such findings may harm our business, financial condition and prospects significantly. Further, if a serious safety issue is identified in connection with use of vonoprazan commercially or in third-party clinical trials in Asia or elsewhere, such issues may adversely affect the development potential of vonoprazan or result in regulatory authorities restricting our ability to develop vonoprazan.

In addition, if vonoprazan or any future product candidate receives marketing approval, and we or others later identify undesirable side effects caused by such products, a number of potentially significant negative consequences could result, including:

- regulatory authorities may withdraw, suspend or limit approvals of such product, or seek an injunction against its manufacturer;
- we may be required to recall a product or change the way such product is administered to patients;
- regulatory authorities may require additional warnings on the label, such as a “black box” warning or a contraindication;
- we may be required to implement a Risk Evaluation and Mitigation Strategy, or REMS, or create a medication guide outlining the risks of such side effects for distribution to patients;
- we may be required to change the way a product is distributed or administered, conduct additional clinical trials or change the labeling of a product or be required to conduct additional post-marketing studies or surveillance;
- we could be sued and held liable for harm caused to patients;
- sales of the product may decrease significantly or the product could become less competitive; and
- our reputation may suffer.

Any of these events could prevent us from achieving or maintaining market acceptance of the particular product candidate, if approved, and could significantly harm our business, results of operations and prospects.

***As a company, we have never conducted a clinical trial or submitted an NDA or comparable foreign regulatory filing, and may be unable to do so for vonoprazan or any future product candidates.***

We are early in our development efforts for vonoprazan, and we will need to successfully complete pivotal clinical trials in order to obtain FDA, EMA or comparable foreign regulatory approval to market vonoprazan or any future product candidates. Carrying out late-stage clinical trials and the submission of a successful new drug application, or NDA, is a complicated process. As an

organization, we plan to commence pivotal Phase 3 clinical trials of vonoprazan in erosive esophagitis and *H. pylori* infection in the fourth quarter of 2019. We have not yet conducted any clinical trials for vonoprazan or any other product candidates and have limited experience as a company in preparing, submitting and prosecuting regulatory filings. As a company, we have not previously submitted an NDA, whether for one or multiple indications, or other comparable foreign regulatory submission for any product candidate. In addition, we have had limited interactions with the FDA and cannot be certain how many clinical trials of vonoprazan or any other product candidates will be required or how such trials should be designed. Consequently, we may be unable to successfully and efficiently execute and complete necessary clinical trials in a way that leads to regulatory submission and approval of vonoprazan or any future product candidates. We may require more time and incur greater costs than our competitors and may not succeed in obtaining regulatory approvals of product candidates that we develop. Failure to commence or complete, or delays in, our planned clinical trials, could prevent us from or delay us in submitting NDAs for and commercializing vonoprazan or any future product candidates.

***Vonoprazan and any future product candidates are subject to extensive regulation and compliance obligations, which is costly and time consuming, and such regulation may cause unanticipated delays or prevent the receipt of the required approvals to commercialize vonoprazan and any future product candidates.***

The clinical development, manufacturing, labeling, storage, record-keeping, advertising, promotion, import, export, marketing and distribution of vonoprazan and any future product candidates are subject to extensive regulation by the FDA in the United States, the EMA in the European Union and by comparable foreign regulatory authorities in other foreign markets. In the United States, we are not permitted to market vonoprazan and any future product candidates until we receive regulatory approval from the FDA and in Europe, we are not permitted to market vonoprazan and any future product candidates until we receive regulatory approval from the EMA. The process of obtaining regulatory approval is expensive, often takes many years following the commencement of clinical trials and can vary substantially based upon the type, complexity and novelty of the product candidates involved, as well as the target indications and patient population. The ability of the FDA and EMA to review and approve new products can be affected by a variety of factors, including government budget and funding levels and the ability to hire and retain key personnel. In addition, approval policies or regulations may change, and the FDA and EMA have substantial discretion in the drug approval process, including the ability to delay, limit or deny approval of a product candidate for many reasons. Despite the time and expense invested in clinical development of product candidates, regulatory approval is never guaranteed.

Prior to obtaining approval to commercialize a product candidate in the United States or internationally, we must demonstrate with substantial evidence from adequate and well-controlled clinical trials, and to the satisfaction of the FDA or comparable foreign regulatory authorities, that such product candidates are safe and effective for their intended uses. Results from nonclinical studies and clinical trials can be interpreted in different ways. Even if we believe the nonclinical or clinical data for vonoprazan and any future product candidates are promising, such data may not be sufficient to support approval by the FDA and comparable foreign regulatory authorities. The FDA or comparable foreign regulatory authorities, as the case may be, may also require us to conduct additional preclinical studies or clinical trials for vonoprazan and any future product candidates either prior to or post-approval, or may object to elements of our clinical development program.

The FDA, EMA or other comparable foreign regulatory authorities can delay, limit or deny approval of a product candidate for many reasons, including:

- such authorities may disagree with the design or implementation of our clinical trials;

- negative or ambiguous results from our clinical trials or results may not meet the level of statistical significance required by the FDA, EMA, or other comparable foreign regulatory agencies for approval;
- serious and unexpected drug-related side effects may be experienced by participants in our clinical trials or in clinical trials conducted by Takeda or others outside of our licensed territories, or by patients using vonoprazan or drugs similar to vonoprazan;
- the population studied in the clinical trial may not be sufficiently broad or representative to assure safety in the full population for which we seek approval;
- such authorities may not accept clinical data from trials which are conducted at clinical facilities or in countries where the standard of care is potentially different from that of the United States;
- we may be unable to demonstrate to the satisfaction of such authorities that a product candidate is safe and effective for its proposed indication and that a product candidate's clinical and other benefits outweigh its safety risks;
- such authorities may disagree with our interpretation of data from preclinical studies or clinical trials;
- such authorities may not agree that the data collected from clinical trials of vonoprazan, including data collected from clinical trials conducted by Takeda and independent investigators outside of our licensed territories, and any future product candidates are acceptable or sufficient to support the submission of an NDA or other submission or to obtain regulatory approval, and such authorities may impose requirements for additional preclinical studies or clinical trials;
- such authorities may disagree regarding the formulation, labeling and/or the specifications of vonoprazan and any future product candidates;
- approval may be granted only for indications that are significantly more limited than what we apply for and/or with other significant restrictions on distribution and use;
- such authorities may find deficiencies in the manufacturing processes or facilities of Takeda or any future third-party manufacturers with which we contract for clinical and commercial supplies;
- regulations of such authorities may significantly change in a manner rendering our or any of our potential future collaborators' clinical data insufficient for approval; or
- such authorities may not accept a submission due to, among other reasons, the content or formatting of the submission.

With respect to foreign markets, approval procedures vary among countries and, in addition to the foregoing risks, may involve additional product testing, administrative review periods and agreements with pricing authorities. In addition, events raising questions about the safety of certain marketed pharmaceuticals may result in increased cautiousness by the FDA, EMA, and other comparable foreign regulatory authorities in reviewing new drugs based on safety, efficacy, or other regulatory considerations and may result in significant delays in obtaining regulatory approvals. Any delay in obtaining, or inability to obtain, applicable regulatory approvals would prevent us or any of our potential future collaborators from commercializing vonoprazan and any future product candidates.

Of the large number of drugs in development, only a small percentage successfully complete the FDA, EMA or foreign regulatory approval processes and are commercialized. The lengthy approval process as well as the unpredictability of future clinical trial results may result in our failing to obtain regulatory approval to market vonoprazan and any future product candidates, which would significantly harm our business, financial condition, results of operations and prospects.

Even if we eventually complete clinical trials and receive approval of an NDA or foreign marketing application for vonoprazan and any future product candidates, the FDA, EMA or other comparable foreign regulatory authority may grant approval contingent on the performance of costly additional clinical trials, including confirmatory Phase 3 clinical trials, Phase 4 clinical trials, and/or the implementation of a REMS, which may be required to ensure safe use of the drug after approval. The FDA, EMA or other comparable foreign regulatory authority also may approve a product candidate for a more limited indication or patient population than we originally requested, and the FDA, EMA or other comparable foreign regulatory authority may not approve the labeling that we believe is necessary or desirable for the successful commercialization of a product. Any delay in obtaining, or inability to obtain, applicable regulatory approval would delay or prevent commercialization of that product candidate and would materially adversely impact our business and prospects.

***Designation of vonoprazan as a QIDP, and the potential to receive priority review or fast track designations, may not actually lead to a faster development or regulatory review, and would not assure FDA approval of vonoprazan or any future product candidates which may receive such designations.***

Vonoprazan has been designated as a QIDP by the FDA for the treatment of *H. pylori* infection in combination with both amoxicillin and clarithromycin, and with amoxicillin alone, respectively, and we may seek QIDP designation for future product candidates. A QIDP is an antibacterial or antifungal drug for human use intended to treat serious or life-threatening infections, including those caused by either (1) an antibacterial or antifungal resistant pathogen, including novel or emerging infectious pathogens, or (2) a so-called “qualifying pathogen” found on a list of potentially dangerous, drug-resistant organisms to be established and maintained by the FDA under the Generating Antibiotic Incentives Now, or GAIN Act. The benefits of QIDP designation include potential eligibility for priority review and fast track designation, and an extension by an additional five years of any non-patent exclusivity period awarded, such as a five-year exclusivity period awarded for a new chemical entity. This extension is in addition to any pediatric exclusivity extension that may be awarded. Receipt of QIDP status also does not assure ultimate approval by the FDA or related GAIN Act exclusivity benefits.

While QIDP designation makes vonoprazan potentially eligible for priority review and fast track designation, the FDA has broad discretion, so even if we believe vonoprazan or any future product candidate is eligible for fast track designation or priority review status, the FDA could decide not to grant it. The fast track program is intended to expedite or facilitate the process for reviewing new drug candidates that meet certain criteria. Specifically, new drugs are eligible for fast track designation if they are intended, alone or in combination with one or more drugs, to treat a serious or life-threatening disease or condition and demonstrate the potential to address unmet medical needs for the disease or condition. Fast track designation applies to the combination of the drug candidate and the specific indication for which it is being studied. With a fast track drug candidate, the FDA may consider for review sections of the NDA on a rolling basis before the complete application is submitted, if the sponsor provides a schedule for the submission of the sections of the NDA, the FDA agrees to accept sections of the NDA and determines that the schedule is acceptable, and the sponsor pays any required user fees upon submission of the first section of the NDA. Priority review means the FDA’s goal is to take action on an application within 6 months (compared to 10 months under standard review). The FDA automatically grants priority review to the first application or efficacy supplement submitted for a specific drug and indication that has received the QIDP designation.

Obtaining a QIDP designation, priority review, or fast track designation does not change the standards for product approval, but may expedite the development or approval process. Even though the FDA has granted QIDP designation for vonoprazan, and even if vonoprazan receives priority review or fast track designations, it may not actually result in faster clinical development or regulatory review or approval. Furthermore, QIDP designation, priority review, and fast track designation do not increase the likelihood that vonoprazan will receive marketing approval in the United States.

***We may not be successful in our efforts to expand our pipeline by identifying additional indications and formulations for which to investigate vonoprazan in the future. We may expend our limited resources to pursue a particular indication or formulation for vonoprazan and fail to capitalize on product candidates, indications or formulations that may be more profitable or for which there is a greater likelihood of success.***

Because we have limited financial and managerial resources, we focus on specific indications and formulations for vonoprazan. As a result, we may fail to generate additional clinical development opportunities for vonoprazan for a number of reasons, including, vonoprazan may in certain indications, on further study, be shown to have harmful side effects, limited to no efficacy, or other characteristics that suggest it is unlikely to receive marketing approval and achieve market acceptance in such additional indications. For example, we believe the rapid onset of action of vonoprazan may enable on-demand, or as needed, use for the management of non-erosive reflux disease, or NERD. However, two Phase 3 clinical trials of vonoprazan in Japanese patients with endoscopically confirmed NERD conducted by Takeda did not demonstrate a statistically significant difference in symptom scores between vonoprazan and placebo. We believe that this result may be due to the selection of patients with mild to moderate symptoms rather than more frequent and severe symptoms. In addition, Takeda conducted a Phase 2 clinical trial in Europe in 256 patients with NERD who were partial responders to high dose PPIs. Patients were randomized to receive vonoprazan 20 mg, vonoprazan 40 mg, or esomeprazole 40 mg for four weeks. Neither vonoprazan dose demonstrated a benefit versus esomeprazole on the primary endpoint of the percentage of heartburn free days over the treatment period. We believe this result may be due to patient selection. Specifically, the trial may not have adequately selected for patients with NERD and may have included patients with functional GI disorders that are unrelated to acid, such as functional dyspepsia or functional heartburn. We may be incorrect in our beliefs regarding the results of such trials and any future clinical trials we conduct in NERD patients may not succeed for similar or other reasons, including as a result of our design and enrollment criteria.

Furthermore, research programs to identify additional indications for vonoprazan require substantial technical, financial and human resources. We may also pursue additional formulations and packaging for vonoprazan, such as orally disintegrating tablets and other oral dosage forms for patients with difficulty swallowing, an intravenous formulation for in-hospital applications, and pre-packaged convenience packs for the treatment of *H. pylori* infection. However, we may not successfully develop these additional formulations for chemistry-related, stability-related or other reasons. If we do not accurately evaluate the commercial potential or target market for vonoprazan or any future product candidates, we may relinquish valuable rights to that product candidate through future collaborations, licenses and other similar arrangements in cases in which it would have been more advantageous for us to retain sole development and commercialization rights to such product candidate.

Additionally, we may pursue additional in-licenses or acquisitions of development-stage assets or programs, which entails additional risk to us. Identifying, selecting and acquiring promising product candidates requires substantial technical, financial and human resources expertise. Efforts to do so may not result in the actual acquisition or license of a particular product candidate, potentially resulting in a diversion of our management's time and the expenditure of our resources with no resulting benefit.

***We intend to enroll patients in Europe in both of our planned Phase 3 clinical trials. Additionally, we may conduct future clinical trials outside of the United States. However, the FDA and other comparable foreign regulatory authorities may not accept data from such trials, in which case our development plans will be delayed, which could materially harm our business.***

We plan to enroll patients in Europe in both of our planned Phase 3 clinical trials, and we may conduct one or more of our future clinical trials outside the United States. Although the FDA may

accept data from clinical trials conducted outside the United States, acceptance of this data is subject to certain conditions imposed by the FDA. For example, the FDA requires the clinical trial to have been conducted in accordance with GCPs, and the FDA must be able to validate the data from the clinical trial through an onsite inspection if it deems such inspection necessary. In addition, when clinical trials are conducted only at sites outside of the United States, the FDA generally does not provide advance comment on the clinical protocols for the trials, and therefore there is an additional potential risk that the FDA could determine that the study design or protocol for a non-U.S. clinical trial was inadequate, which would likely require us to conduct additional clinical trials. The FDA may not accept data from clinical trials conducted outside of the United States. If the FDA does not accept data from our clinical trials of vonoprazan and any future product candidates, it would likely result in the need for additional clinical trials, which would be costly and time consuming and delay or permanently halt our development of vonoprazan and any future product candidates.

Conducting clinical trials outside the United States also exposes us to additional risks, including risks associated with:

- additional foreign regulatory requirements;
- foreign exchange fluctuations;
- compliance with foreign manufacturing, customs, shipment and storage requirements;
- cultural differences in medical practice and clinical research; and
- diminished protection of intellectual property in some countries.

***Interim, top-line and preliminary data from clinical trials that we or others announce or publish from time to time may change as more patient data become available and are subject to audit and verification procedures that could result in material changes in the final data.***

From time to time, we or others, such as Takeda, may publicly disclose preliminary or top-line data from clinical trials, which are based on a preliminary analysis of then-available data, and the results and related findings and conclusions are subject to change following a more comprehensive review of the data related to the particular study or trial. We also make assumptions, estimations, calculations and conclusions as part of our analyses of data, and we may not have received or had the opportunity to fully and carefully evaluate all data. As a result, the top-line results that we or others report may differ from future results of the same clinical trials, or different conclusions or considerations may qualify such results, once additional data have been received and fully evaluated. Top-line data also remain subject to audit and verification procedures that may result in the final data being materially different from the preliminary data previously published. As a result, top-line data should be viewed with caution until the final data are available. From time to time, we or others may also disclose interim data from clinical trials. Interim data from clinical trials are subject to the risk that one or more of the clinical outcomes may materially change as patient enrollment continues and more patient data become available. Adverse differences between preliminary or interim data and final data could significantly harm our business prospects.

Further, others, including regulatory agencies, may not accept or agree with our assumptions, estimates, calculations, conclusions or analyses or may interpret or weigh the importance of data differently, which could impact the value of the particular program, the approvability or commercialization of the particular product candidate or product and our company in general. In addition, the information we choose to publicly disclose regarding a particular study or clinical trial is based on what is typically extensive information, and you or others may not agree with what we determine is the material or otherwise appropriate information to include in our disclosure, and any information we determine not to disclose may ultimately be deemed significant with respect to future

decisions, conclusions, views, activities or otherwise regarding a particular drug, drug candidate or our business. If the top-line data that we report differ from actual results, or if others, including regulatory authorities, disagree with the conclusions reached, our ability to obtain approval for, and commercialize, vonoprazan and any future product candidates may be harmed, which could harm our business, operating results, prospects, or financial condition.

**Risks Related to Our Reliance on Third Parties**

***We rely on the Takeda License to provide us rights to develop and commercialize vonoprazan in the United States, Europe, and Canada. If the license agreement is terminated, we would lose our rights to develop and commercialize vonoprazan.***

Pursuant to the Takeda License, we have secured an exclusive license from Takeda to commercialize vonoprazan products using specified formulations for all human therapeutic uses in the United States, Europe, and Canada, and a non-exclusive license to develop and manufacture vonoprazan products anywhere in the world (subject to Takeda's consent as to each country) for the purposes of commercializing the vonoprazan products in the United States, Europe, and Canada.

The Takeda License will continue until the expiration of the obligation to pay royalties in all countries and on all products, unless terminated earlier. We may terminate the Takeda License in its entirety without cause upon prior written notice. We and Takeda may terminate the Takeda License in the case of the other party's insolvency or for the other party's material uncured breach. Takeda may terminate the Takeda License in its entirety if we challenge the licensed patents, or if we assist any third party in challenging such patents. In addition, if any of the regulatory milestones or other cash payments become due under the terms of the Takeda License, we may not have sufficient funds available to meet our obligations, which would allow Takeda to terminate the Takeda License. If the license agreement is terminated, we would lose our rights to develop and commercialize vonoprazan, which in turn would have a material adverse effect on our business, operating results and prospects.

***We intend to rely on third parties to conduct our clinical trials. Any failure by a third party to conduct the clinical trials according to GCPs and other requirements and in a timely manner may delay or prevent our ability to seek or obtain regulatory approval for or commercialize vonoprazan and any future product candidates.***

We will be dependent on third parties to conduct our preclinical and clinical trials, including our planned Phase 3 clinical trials of vonoprazan. Specifically, we intend to use and rely on, medical institutions, clinical investigators, CROs and consultants to conduct our clinical trials in accordance with our clinical protocols and regulatory requirements. These CROs, investigators and other third parties will play a significant role in the conduct and timing of these trials and subsequent collection and analysis of data. While we have agreements governing the activities of our third-party contractors, we have limited influence over their actual performance. Nevertheless, we are responsible for ensuring that each of our clinical trials is conducted in accordance with the applicable protocol and legal, regulatory and scientific standards, and our reliance on the CROs and other third parties does not relieve us of our regulatory responsibilities. We and our CROs are required to comply with GCP requirements, which are regulations and guidelines enforced by the FDA and comparable foreign regulatory authorities for vonoprazan and any future product candidates that reach clinical development. Regulatory authorities enforce these GCPs through periodic inspections of trial sponsors, principal investigators and trial sites. If we or any of our CROs or trial sites fail to comply with applicable GCPs, the clinical data generated in our clinical trials may be deemed unreliable, and the FDA or comparable foreign regulatory authorities may require us to perform additional clinical trials before approving our marketing applications. In addition, our clinical trials must be conducted with product produced under cGMP regulations. Our failure to comply with these regulations may require us to repeat clinical trials, which would delay the regulatory approval process.

CROs, investigators or other third parties may not devote adequate time and resources to such trials or perform as contractually required. If any of these third parties fail to meet expected deadlines, adhere to our clinical protocols or meet regulatory requirements, or otherwise performs in a substandard manner, our clinical trials may be extended, delayed, or terminated. In addition, many of the third parties with whom we contract may also have relationships with other commercial entities, including our competitors, for whom they may also be conducting clinical trials or other drug development activities that could harm our competitive position. In addition, principal investigators for our clinical trials may serve as scientific advisors or consultants to us from time to time and may receive cash or equity compensation in connection with such services. If these relationships and any related compensation result in perceived or actual conflicts of interest, or the FDA concludes that the financial relationship may have affected the interpretation of the study, the integrity of the data generated at the applicable clinical trial site may be questioned and the utility of the clinical trial itself may be jeopardized, which could result in the delay or rejection of any NDA we submit by the FDA. Any such delay or rejection could prevent us from commercializing vonoprazan and any future product candidates.

If any of our relationships with these third parties terminate, we may not be able to enter into arrangements with alternative third parties or do so on commercially reasonable terms. Switching or adding additional CROs, investigators and other third parties involves additional cost and requires management time and focus. In addition, there is a natural transition period when a new CRO commences work. As a result, delays occur, which can materially impact our ability to meet our desired clinical development timelines. Though we carefully manage our relationships with our CROs, investigators and other third parties, we may encounter challenges or delays in the future and these delays or challenges may have a material adverse impact on our business, financial condition and prospects.

***We currently rely on Takeda for the manufacture of vonoprazan for clinical development and expect to continue to do so for the foreseeable future. This reliance on a third party increases the risk that we will not have sufficient quantities of vonoprazan or such quantities at an acceptable cost, which could delay, prevent or impair our development or commercialization efforts.***

We do not own or operate manufacturing facilities and have no plans to build our own clinical or commercial scale manufacturing capabilities. Pursuant to the Takeda License, we entered in a clinical manufacturing and supply agreement with Takeda for the supply of vonoprazan for our clinical trials. In addition, we have the option to negotiate in good faith to enter into a commercial supply agreement with Takeda for the commercial supply of vonoprazan, and we are exploring additional options for commercial supply of vonoprazan from other third party contract manufacturers. As a result, we currently rely, and expect to continue to rely, on Takeda for the manufacture of vonoprazan and related raw materials for clinical development, as well as for commercial manufacture if vonoprazan receives marketing approval. However, we may not be able to enter into a commercial supply agreement with Takeda or other third parties on acceptable terms, or at all. The facilities used by Takeda to manufacture vonoprazan must be approved by the FDA for the manufacture of vonoprazan pursuant to inspections that may be conducted after we submit marketing authorizations to the FDA and comparable foreign regulatory authorities. We do not control the manufacturing process of, and are completely dependent on, Takeda for compliance with cGMP requirements for manufacture of drug products. If Takeda, or any other third party manufacturer we contract with in the future, cannot successfully manufacture material that conforms to our specifications and the strict regulatory requirements of the FDA or others, including requirements related to the manufacturing of high potency compounds, they will not be able to secure and/or maintain regulatory approval for their manufacturing facilities. In addition, we have no control over Takeda's ability to maintain adequate quality control, quality assurance and qualified personnel. If the FDA or a comparable foreign regulatory authority does

not approve of facilities of the third-party manufacturer for the manufacture of vonoprazan or if it withdraws any such approval in the future, we may need to find alternative manufacturing facilities, which would significantly impact our ability to develop, obtain regulatory approval for or market vonoprazan, if approved. Our failure, or Takeda's failure, to comply with applicable regulations could result in sanctions being imposed on us, including clinical holds, fines, injunctions, civil penalties, delays, suspension or withdrawal of approvals, seizures or recalls of product candidates or products, operating restrictions and criminal prosecutions, any of which could significantly and adversely affect supplies of our products. Furthermore, Takeda may choose to prioritize the manufacture of vonoprazan for its markets over the manufacture of vonoprazan for our licensed markets.

Our or Takeda's failure, or the failure of any future third-party manufacturer, to execute on our manufacturing requirements, to do so on commercially reasonable terms and comply with cGMP could adversely affect our business in a number of ways, including:

- an inability to initiate and continue clinical trials of vonoprazan or any future product candidates;
- delay in submitting regulatory applications, or receiving marketing approvals, for vonoprazan and any future product candidates;
- subjecting third-party manufacturing facilities or our manufacturing facilities to additional inspections by regulatory authorities;
- requirements to cease development or to recall batches of vonoprazan and any future product candidates; and
- in the event of approval to market and commercialize vonoprazan or any future product candidates, an inability to meet commercial demands for vonoprazan or any future product candidates.

Reliance on third-party manufacturers entails additional risks, including:

- failure of third-party manufacturers to comply with regulatory requirements and maintain quality assurance;
- breach of the manufacturing agreement by the third party;
- failure to manufacture our product according to our specifications;
- failure to manufacture our product according to our schedule or at all;
- misappropriation of our proprietary information, including our trade secrets and know-how; and
- termination or nonrenewal of the agreement by the third party at a time that is costly or inconvenient for us.

Vonoprazan and any products that we may develop may compete with other product candidates and products for access to manufacturing facilities. Moreover, there may be a limited number of manufacturers that operate under cGMP regulations and that might be capable of manufacturing for us.

Any performance failure on the part of Takeda or any future manufacturers could delay clinical development or marketing approval, and any related remedial measures may be costly or time consuming to implement. We do not currently have arrangements in place for redundant supply or a second source for all required raw materials used in the manufacture of vonoprazan and any future product candidates. If Takeda cannot perform as agreed, we may be required to replace Takeda and we may be unable to replace them on a timely basis or at all.

Our current and anticipated future dependence upon others for the manufacture of vonoprazan or any future product candidates or products may adversely affect our future profit margins and our ability to commercialize any products that receive marketing approval on a timely and competitive basis.

***Our reliance on third parties, including Takeda, requires us to share our trade secrets, which increases the possibility that a competitor will discover them or that our trade secrets will be misappropriated or disclosed.***

Because we currently rely on Takeda to manufacture vonoprazan and to perform quality testing, we must, at times, share our proprietary technology and confidential information, including trade secrets, with them. We seek to protect our proprietary technology, in part, by entering into confidentiality agreements, consulting agreements or other similar agreements with our advisors, employees and consultants prior to beginning research or disclosing proprietary information. These agreements typically limit the rights of the third parties to use or disclose our confidential information. Despite the contractual provisions employed when working with third parties, the need to share trade secrets and other confidential information increases the risk that such trade secrets become known by our competitors, are intentionally or inadvertently incorporated into the technology of others or are disclosed or used in violation of these agreements. Given that our proprietary position is based, in part, on our know-how and trade secrets and despite our efforts to protect our trade secrets, a competitor's discovery of our proprietary technology and confidential information or other unauthorized use or disclosure would impair our competitive position and may have a material adverse effect on our business, financial condition, results of operations and prospects.

***We may seek to enter into collaborations, licenses and other similar arrangements and may not be successful in doing so, and even if we are, we may not realize the benefits of such relationships.***

We may seek to enter into collaborations, joint ventures, licenses and other similar arrangements for the development or commercialization of vonoprazan and any future product candidates, due to capital costs required to develop or commercialize vonoprazan and any future product candidates or manufacturing constraints. We may not be successful in our efforts to establish such collaborations for vonoprazan and any future product candidates because vonoprazan and any future product candidates may be deemed to be at too early of a stage of development for collaborative effort or third parties may not view vonoprazan and any future product candidates as having the requisite potential to demonstrate safety and efficacy or significant commercial opportunity. In addition, we face significant competition in seeking appropriate strategic partners, and the negotiation process can be time consuming and complex. Further, any future collaboration agreements may restrict us from entering into additional agreements with potential collaborators. Following a strategic transaction or license, we may not achieve an economic benefit that justifies such transaction.

Even if we are successful in our efforts to establish such collaborations, the terms that we agree upon may not be favorable to us, and we may not be able to maintain such collaborations if, for example, development or approval of a product candidate is delayed, the safety of a product candidate is questioned or sales of an approved product candidate are unsatisfactory.

In addition, any potential future collaborations may be terminable by our strategic partners, and we may not be able to adequately protect our rights under these agreements. Furthermore, strategic partners may negotiate for certain rights to control decisions regarding the development and commercialization of vonoprazan and any future product candidates, if approved, and may not conduct those activities in the same manner as we do. Any termination of collaborations we enter into in the future, or any delay in entering into collaborations related to vonoprazan or any future product candidates, could delay the development and commercialization of vonoprazan or any future product

candidates and reduce their competitiveness if they reach the market, which could have a material adverse effect on our business, financial condition and results of operations.

**Risks Related to Commercialization of Vonoprazan and Any Future Product Candidates**

***Even if we receive regulatory approval for vonoprazan and any future product candidates, we will be subject to ongoing regulatory obligations and continued regulatory review, which may result in significant additional expense. Additionally, vonoprazan and any future product candidates, if approved, could be subject to labeling and other restrictions on marketing or withdrawal from the market, and we may be subject to penalties if we fail to comply with regulatory requirements or if we experience unanticipated problems with vonoprazan and any future product candidates, if approved.***

Following potential approval of vonoprazan or any future product candidates, the FDA, EMA or other comparable regulatory authority may impose significant restrictions on a product's indicated uses or marketing or impose ongoing requirements for potentially costly and time consuming post-approval studies, post-market surveillance or clinical trials to monitor the safety and efficacy of the product. The FDA may also require a REMS as a condition of approval of vonoprazan or any future product candidates, which could include requirements for a medication guide, physician communication plans or additional elements to ensure safe use, such as restricted distribution methods, patient registries and other risk minimization tools. In addition, if the FDA, EMA or a comparable foreign regulatory authority approves vonoprazan or any future product candidates, the manufacturing processes, labeling, packaging, distribution, adverse event reporting, storage, advertising, promotion, import, export and recordkeeping for our products will be subject to extensive and ongoing regulatory requirements. These requirements include submissions of safety and other post-marketing information and reports, registration, as well as continued compliance with cGMPs and GCP requirements for any clinical trials that we conduct post-approval. Later discovery of previously unknown problems with our products, including adverse events of unanticipated severity or frequency, or with our third-party manufacturers or manufacturing processes, or failure to comply with regulatory requirements, may result in, among other things:

- restrictions on the marketing or manufacturing of our products, withdrawal of the product from the market or voluntary or mandatory product recalls;
- restrictions on product distribution or use, or requirements to conduct post-marketing studies or clinical trials;
- fines, restitutions, disgorgement of profits or revenues, warning letters, untitled letters or holds on clinical trials;
- refusal by the FDA or comparable foreign regulatory authority to approve pending applications or supplements to approved applications filed by us or suspension or revocation of approvals;
- product seizure or detention, or refusal to permit the import or export of our products; and
- injunctions or the imposition of civil or criminal penalties.

The occurrence of any event or penalty described above may inhibit our ability to commercialize vonoprazan and any future product candidates and generate revenue and could require us to expend significant time and resources in response and could generate negative publicity.

In addition, if vonoprazan or any future product candidate is approved, our product labeling, advertising and promotion will be subject to regulatory requirements and continuing regulatory review. The FDA strictly regulates the promotional claims that may be made about drug products. In particular, a product may not be promoted for uses that are not approved by the FDA as reflected in the product's

approved labeling. However, companies may share truthful and not misleading information that is otherwise consistent with a product's FDA approved labeling. If we receive marketing approval for vonoprazan or any future product candidate, physicians may nevertheless prescribe it to their patients in a manner that is inconsistent with the approved label. If we are found to have promoted such off-label uses, we may become subject to significant liability. The FDA and other agencies actively enforce the laws and regulations prohibiting the promotion of off-label uses, and a company that is found to have improperly promoted off-label uses may be subject to significant sanctions. The federal government has levied large civil and criminal fines against companies for alleged improper promotion and has enjoined several companies from engaging in off-label promotion. The FDA has also requested that companies enter into consent decrees or permanent injunctions under which specified promotional conduct is changed or curtailed.

The FDA's and other regulatory authorities' policies may change and additional government regulations may be enacted that could prevent, limit or delay regulatory approval of vonoprazan and any future product candidates. If we are slow or unable to adapt to changes in existing requirements or the adoption of new requirements or policies, or if we are not able to maintain regulatory compliance, we may lose any marketing approval that we may have obtained and we may not achieve or sustain profitability.

We also cannot predict the likelihood, nature or extent of government regulation that may arise from future legislation or administrative or executive action, either in the United States or internationally. The policies of the FDA and of other regulatory authorities may change and additional governmental regulations may be enacted that could prevent, limit or delay regulatory approval of vonoprazan or any future product candidates. For example, certain policies of the current U.S. administration may impact our business and industry. Namely, the current U.S. administration has taken several executive actions, including the issuance of a number of Executive Orders, that could impose significant burdens on, or otherwise materially delay, the FDA's ability to engage in routine regulatory and oversight activities such as implementing statutes through rulemaking, issuance of guidance, and review and approval of marketing applications. It is difficult to predict how these executive actions, including the Executive Orders, will be implemented, and the extent to which they will impact the FDA's ability to exercise its regulatory authority. If these executive actions impose constraints on the FDA's ability to engage in oversight and implementation activities in the normal course, our business may be negatively impacted.

If we are slow or unable to adapt to changes in existing requirements or the adoption of new requirements or policies, or if we are not able to maintain regulatory compliance, we may lose any marketing approval that we may have obtained and we may not achieve or sustain profitability, which would adversely affect our business, prospects, financial condition and results of operations. Non-compliance by us or any future collaborator with regulatory requirements, including safety monitoring or pharmacovigilance, and with requirements related to the development of products for the pediatric population can also result in significant financial penalties.

***The commercial success of vonoprazan or any future product candidates will depend upon the degree of market acceptance of such product candidates by physicians, patients, healthcare payors and others in the medical community.***

Vonoprazan and any future product candidates may not be commercially successful. The commercial success of vonoprazan or any future product candidates, if approved, will depend significantly on the broad adoption and use of such product by physicians and patients for approved indications. The degree of market acceptance of vonoprazan or any future products, if approved, will depend on a number of factors, including:

- demonstration of clinical efficacy and safety compared to other more-established products;

- the indications for which vonoprazan or any future product candidates are approved;
- the limitation of our targeted patient population and other limitations or warnings contained in any FDA-approved labeling;
- acceptance of a new drug for the relevant indication by healthcare providers and their patients;
- the pricing and cost-effectiveness of our products, as well as the cost of treatment with our products in relation to alternative treatments and therapies;
- our ability to obtain and maintain sufficient third-party coverage and adequate reimbursement from government healthcare programs, including Medicare and Medicaid, private health insurers and other third-party payors;
- the willingness of patients to pay all, or a portion of, out-of-pocket costs associated with our products in the absence of sufficient third-party coverage or adequate reimbursement;
- any restrictions on the use of our products, and the prevalence and severity of any adverse effects;
- potential product liability claims;
- the timing of market introduction of our products as well as competitive drugs;
- the effectiveness of our or any of our potential future collaborators' sales and marketing strategies; and
- unfavorable publicity relating to the product.

If vonoprazan or any future product candidate is approved but does not achieve an adequate level of acceptance by physicians, hospitals, healthcare payors or patients, we may not generate sufficient revenue from that product and may not become or remain profitable. Our efforts to educate the medical community and third-party payors regarding the benefits of our products may require significant resources and may never be successful.

With respect to vonoprazan, Takeda has the right to develop and commercialize the product outside of the United States, Europe, and Canada and has received marketing approval for vonoprazan in certain countries in Asia and Latin America. We have little or no control over Takeda's commercialization activities with respect to vonoprazan outside of our licensed territories even though those activities could impact our ability to successfully commercialize vonoprazan. For example, Takeda can make statements or use promotional materials with respect to vonoprazan outside of our licensed territories that are inconsistent with our positioning of the product in the United States, Europe, and Canada, and could sell vonoprazan in foreign countries at prices that are dramatically lower than the prices we would charge in our licensed territories. These activities and decisions, while occurring outside of our licensed territories, could harm our commercialization strategy. In addition, product recalls or safety issues with vonoprazan outside our licensed territories could result in serious damage to the brand and impair our ability to successfully market vonoprazan in our licensed territories.

***The FDA and other regulatory agencies actively enforce the laws and regulations prohibiting the promotion of off-label uses. If we are found or alleged to have improperly promoted off-label uses, we may become subject to significant liability.***

The FDA and other regulatory agencies strictly regulate the promotional claims that may be made about prescription products, as vonoprazan and any future product candidates would be, if approved. In particular, a product may not be promoted for uses that are not approved by the FDA or such other regulatory agencies as reflected in the product's approved labeling. If we receive marketing approval for a product candidate, physicians may nevertheless prescribe it to their patients in a manner that is

inconsistent with the approved label. If we are found to have promoted such off-label uses, we may become subject to significant liability. The federal government has levied large civil and criminal fines against companies for alleged improper promotion and has enjoined several companies from engaging in off-label promotion. The FDA has also requested that companies enter into consent decrees or permanent injunctions under which specified promotional conduct is changed or curtailed. If we cannot successfully manage the promotion of vonoprazan or any future product candidates, if approved, we could become subject to significant liability, which would materially adversely affect our business and financial condition.

***The successful commercialization of vonoprazan or any future product candidates, if approved, will depend in part on the extent to which governmental authorities and health insurers establish coverage, adequate reimbursement levels and favorable pricing policies. Failure to obtain or maintain coverage and adequate reimbursement for our products could limit our ability to market those products and decrease our ability to generate revenue.***

The availability of coverage and the adequacy of reimbursement by governmental healthcare programs, such as Medicare and Medicaid, private health insurers and other third-party payors are essential for most patients to be able to afford prescription medications such as vonoprazan or any future product candidate, if approved. Our ability to achieve coverage and acceptable levels of reimbursement for our products by third-party payors will have an effect on our ability to successfully commercialize those products. Even if we obtain coverage for a given product by a third-party payor, the resulting reimbursement payment rates may not be adequate or may require co-payments that patients find unacceptably high. We cannot be sure that coverage and reimbursement in the United States, the European Union or elsewhere will be available for any product that we may develop, and any reimbursement that may become available may be decreased or eliminated in the future.

Third-party payors increasingly are challenging prices charged for pharmaceutical products and services, and many third-party payors may refuse to provide coverage and reimbursement for particular drugs when an equivalent generic drug or a less expensive therapy is available. It is possible that a third-party payor may consider our products as substitutable and only offer to reimburse patients for the less expensive product. Even if we are successful in demonstrating improved efficacy or improved convenience of administration with our products, pricing of existing drugs may limit the amount we will be able to charge for our products. These payors may deny or revoke the reimbursement status of a given product or establish prices for new or existing marketed products at levels that are too low to enable us to realize an appropriate return on our investment in product development. If reimbursement is not available or is available only at limited levels, we may not be able to successfully commercialize our products and may not be able to obtain a satisfactory financial return on products that we may develop.

There is significant uncertainty related to third-party payor coverage and reimbursement of newly approved products. In the United States, third-party payors, including private and governmental payors, such as the Medicare and Medicaid programs, play an important role in determining the extent to which new drugs will be covered. Some third-party payors may require pre-approval of coverage for new or innovative devices or drug therapies before they will reimburse healthcare providers who use such therapies. It is difficult to predict at this time what third-party payors will decide with respect to the coverage and reimbursement for our products.

Obtaining and maintaining reimbursement status is time consuming, costly and uncertain. The Medicare and Medicaid programs increasingly are used as models for how private payors and other governmental payors develop their coverage and reimbursement policies for drugs. However, no uniform policy for coverage and reimbursement for products exists among third-party payors in the United States. Therefore, coverage and reimbursement for products can differ significantly from payor

to payor. As a result, the coverage determination process will require us to provide scientific and clinical support for the use of our products to each payor separately, with no assurance that coverage and adequate reimbursement will be applied consistently or obtained in the first instance. Furthermore, rules and regulations regarding reimbursement change frequently, in some cases at short notice, and we believe that changes in these rules and regulations are likely.

Outside the United States, international operations are generally subject to extensive governmental price controls and other market regulations, and we believe the increasing emphasis on cost-containment initiatives in Europe and other countries has and will continue to put pressure on the pricing and usage of our products. In many countries, the prices of medical products are subject to varying price control mechanisms as part of national health systems. Other countries allow companies to fix their own prices for medical products but monitor and control company profits. Additional foreign price controls or other changes in pricing regulation could restrict the amount that we are able to charge for our products. Accordingly, in markets outside the United States, the reimbursement for our products may be reduced compared with the United States and may be insufficient to generate commercially reasonable revenue and profits.

Moreover, increasing efforts by governmental and third-party payors in the United States and abroad to cap or reduce healthcare costs may cause such organizations to limit both coverage and the level of reimbursement for newly approved products and, as a result, they may not cover or provide adequate payment for our products. We expect to experience pricing pressures in connection with the sale of any of our products due to the trend toward managed healthcare, the increasing influence of health maintenance organizations and additional legislative changes. The downward pressure on healthcare costs in general, particularly prescription drugs and surgical procedures and other treatments, has become very intense. As a result, increasingly high barriers are being erected to the entry of new products.

***We face significant competition, and if our competitors develop technologies or product candidates more rapidly than we do or their technologies are more effective, our ability to develop and successfully commercialize products may be adversely affected.***

The biotechnology and pharmaceutical industries are characterized by rapidly advancing technologies, intense competition and a strong emphasis on proprietary and novel products and product candidates. Our competitors have developed, are developing or may develop products, product candidates and processes competitive with vonoprazan. Any product candidates that we successfully develop and commercialize will compete with existing therapies and new therapies that may become available in the future. We believe that a significant number of products are currently under development, and may become commercially available in the future, for the treatment of GI diseases for which we may attempt to develop vonoprazan or any future product candidates. Our competitors include larger and better funded pharmaceutical, biopharmaceutical, biotechnological and therapeutics companies. Moreover, we may also compete with universities and other research institutions who may be active in the indications we are targeting and could be in direct competition with us. We also compete with these organizations to recruit management, scientists and clinical development personnel, which could negatively affect our level of expertise and our ability to execute our business plan. We will also face competition in establishing clinical trial sites, enrolling patients for clinical trials and in identifying and in-licensing new product candidates. Smaller or early-stage companies may also prove to be significant competitors, particularly through collaborative arrangements with large and established companies.

We expect that vonoprazan, if approved for the treatment of erosive esophagitis and treatment of *H. pylori* infection, will primarily compete with generic PPIs marketed by multiple pharmaceutical companies in both the prescription and OTC markets. Additionally, RedHill Biopharma Ltd. is

developing Talicia, a co-formulated capsule comprising generic omeprazole, amoxicillin, and rifabutin for the treatment of *H. pylori* infection, and filed an NDA in the United States in May 2019. Ironwood Pharmaceuticals, Inc. is developing IW-3718, a bile acid sequestrant, currently in Phase 3 clinical trials as an adjunct to PPIs for the treatment of patients with persistent GERD.

We are also aware of other P-CABs in territories outside of the United States that, if developed and approved in our territories, may compete with vonoprazan. Revaprazan is marketed by Yuhan Corporation in South Korea. Tegoprazan is marketed by CJ Healthcare Corp. in South Korea and is currently in Phase 3 development in Japan by RaQualia Pharma, Inc. Daewoong Pharmaceutical Co., Ltd.'s DWP14012 has been studied in Phase 2 clinical trials in South Korea, and Cinclus Pharma AG's X842 has completed a Phase 1 clinical trial in Europe.

Additionally, we are aware of several clinical-stage PPIs in territories outside of the United States that if developed and approved in our licensed territories may compete with vonoprazan. These include Dexa Medica's DLBS-2411, currently in Phase 3 clinical trials in Indonesia, Sihuan Pharmaceutical's anaprazole, currently in Phase 3 clinical trials in China, Eisai's azeloprazole, currently in a Phase 2 clinical trial in Japan, and Sidem Pharma's tenatoprazole, currently in Phase 2 clinical trials in Europe and Canada.

In July 2012, the Food and Drug Administration Safety and Innovation Act was passed, which included the GAIN Act. The GAIN Act is intended to provide incentives for the development of new, qualified infectious disease products. In December 2016, the 21st Century Cures Act was passed, providing additional support for the development of new infectious disease products. These incentives may result in more competition in the market for new antibiotics and may cause pharmaceutical and biotechnology companies with more resources than we have to shift their efforts towards the development of product candidates that could be competitive with vonoprazan or any future product candidates.

Many of our competitors have significantly greater financial, technical, manufacturing, marketing, sales and supply resources or experience than we do. If we successfully obtain approval for vonoprazan or any future product candidate, we will face competition based on many different factors, including the safety and effectiveness of our products, the ease with which our products can be administered and the extent to which patients accept relatively new routes of administration, the timing and scope of regulatory approvals for these products, the availability and cost of manufacturing, marketing and sales capabilities, price, reimbursement coverage and patent position. Competing products could present superior treatment alternatives, including by being more effective, safer, more convenient, less expensive or marketed and sold more effectively than any products we may develop. Competitive products may make any products we develop obsolete or noncompetitive before we recover the expense of developing and commercializing vonoprazan or any future product candidates. If we are unable to compete effectively, our opportunity to generate revenue from the sale of our products we may develop, if approved, could be adversely affected.

***If the market opportunities for vonoprazan or any future products are smaller than we believe they are, our revenue may be adversely affected, and our business may suffer.***

The precise incidence and prevalence for all the conditions we aim to address with vonoprazan or any future product candidates are unknown. Our projections of both the number of people who have these diseases, as well as the subset of people with these diseases who have the potential to benefit from treatment of vonoprazan or any future product candidates, are based on our beliefs and estimates. These estimates have been derived from a variety of sources, including the scientific literature, surveys of clinics or market research, and may prove to be incorrect. Further, new trials may change the estimated incidence or prevalence of these diseases. The total addressable market across

vonoprazan and any future product candidates will ultimately depend upon, among other things, the diagnosis criteria included in the final label for each of vonoprazan and any future product candidates approved for sale for these indications, the availability of alternative treatments and the safety, convenience, cost and efficacy of vonoprazan and any future product candidates relative to such alternative treatments, acceptance by the medical community and patient access, drug pricing and reimbursement. The number of patients in the United States and other major markets and elsewhere may turn out to be lower than expected, patients may not be otherwise amenable to treatment with our products or new patients may become increasingly difficult to identify or gain access to, all of which would adversely affect our results of operations and our business.

***We currently have no marketing and sales organization and have no experience as a company in commercializing products, and we may have to invest significant resources to develop these capabilities. If we are unable to establish marketing and sales capabilities or enter into agreements with third parties to market and sell our products, we may not be able to generate product revenue.***

We have no internal sales, marketing or distribution capabilities, nor have we commercialized a product. If vonoprazan or any future product candidates ultimately receive regulatory approval, we must build a marketing and sales organization with technical expertise and supporting distribution capabilities to commercialize each such product in major markets, which will be expensive and time consuming, or collaborate with third parties that have direct sales forces and established distribution systems, either to augment our own sales force and distribution systems or in lieu of our own sales force and distribution systems. We plan to independently commercialize vonoprazan in the United States by building a leading specialty gastroenterology commercial infrastructure to support the adoption of vonoprazan and we plan to seek one or more partners with existing commercial infrastructure and expertise in Europe and Canada. We have no prior experience as a company in the marketing, sale and distribution of biopharmaceutical products and there are significant risks involved in building and managing a marketing and sales organization, including our ability to hire, retain and incentivize qualified individuals, generate sufficient sales leads, provide adequate training to sales and marketing personnel and effectively manage a geographically dispersed sales and marketing team. Any failure or delay in the development of our internal sales, marketing and distribution capabilities would adversely impact the commercialization of these products. We may not be able to enter into collaborations or hire consultants or external service providers to assist us in sales, marketing and distribution functions on acceptable financial terms, or at all. In addition, our product revenues and our profitability, if any, may be lower if we rely on third parties for these functions than if we were to market, sell and distribute any products that we develop ourselves. We likely will have little control over such third parties, and any of them may fail to devote the necessary resources and attention to sell and market our products effectively. If we are not successful in commercializing vonoprazan or any future product candidates, either on our own or through arrangements with one or more third parties, we may not be able to generate any future product revenue and we would incur significant additional losses.

***Our future growth may depend, in part, on our ability to operate in foreign markets, particularly Europe and Canada, where we would be subject to additional regulatory burdens and other risks and uncertainties.***

Our future growth may depend, in part, on our ability to develop and commercialize vonoprazan and any future product candidates in foreign markets, particularly Europe and Canada. We are not permitted to market or promote vonoprazan and any future product candidates before we receive regulatory approval from applicable regulatory authorities in foreign markets, and we may never receive such regulatory approvals for vonoprazan or any future product candidates. To obtain separate regulatory approval in any other countries we must comply with numerous and varying regulatory requirements regarding safety and efficacy and governing, among other things, clinical trials,

commercial sales, pricing and distribution of vonoprazan and any future product candidates. If we obtain regulatory approval of vonoprazan and any future product candidates and ultimately commercialize our products in foreign markets, we would be subject to additional risks and uncertainties, including:

- different regulatory requirements for approval of drugs in foreign countries;
- reduced protection for intellectual property rights;
- the existence of additional third-party patent rights of potential relevance to our business;
- unexpected changes in tariffs, trade barriers and regulatory requirements;
- economic weakness, including inflation, or political instability in particular foreign economies and markets;
- compliance with tax, employment, immigration and labor laws for employees living or traveling internationally;
- foreign currency fluctuations, which could result in increased operating expenses and reduced revenues, and other obligations incident to doing business in another country;
- foreign reimbursement, pricing and insurance regimes;
- workforce uncertainty in countries where labor unrest is common;
- production shortages resulting from any events affecting raw material supply or manufacturing capabilities internationally; and
- business interruptions resulting from geopolitical actions, including war and terrorism, or natural disasters including earthquakes, typhoons, floods and fires.

**Risks Related to Our Business Operations and Industry**

***Our operating results may fluctuate significantly, which makes our future operating results difficult to predict and could cause our operating results to fall below expectations or any guidance we may provide.***

Our quarterly and annual operating results may fluctuate significantly, which makes it difficult for us to predict our future operating results. These fluctuations may occur due to a variety of factors, many of which are outside of our control, including, but not limited to:

- the timing and cost of, and level of investment in, research, development, regulatory approval and commercialization activities relating to vonoprazan or any future product candidates, which may change from time to time;
- coverage and reimbursement policies with respect to vonoprazan or any future product candidates, if approved, and potential future drugs that compete with such products, if approved;
- the cost of manufacturing vonoprazan or any future product candidates, which may vary depending on the quantity of production and the terms of our agreements with Takeda and any future third-party manufacturers;
- the timing and amount of the milestone or other payments we will be required to pay to Takeda pursuant to the Takeda License;
- expenditures that we may incur to acquire, develop or commercialize additional product candidates and technologies;
- the level of demand for any approved products, which may vary significantly;

- future accounting pronouncements or changes in our accounting policies; and
- the timing and success or failure of preclinical studies or clinical trials for vonoprazan or any future product candidates or competing product candidates, or any other change in the competitive landscape of our industry, including consolidation among our competitors or partners.

The cumulative effects of these factors could result in large fluctuations and unpredictability in our quarterly and annual operating results. As a result, comparing our operating results on a period-to-period basis may not be meaningful. Investors should not rely on our past results as an indication of our future performance.

This variability and unpredictability could also result in our failing to meet the expectations of industry or financial analysts or investors for any period. If our revenue or operating results fall below the expectations of analysts or investors or below any forecasts we may provide to the market, or if the forecasts we provide to the market are below the expectations of analysts or investors, the price of our common stock could decline substantially. Such a stock price decline could occur even when we have met any previously publicly stated revenue or earnings guidance we may provide.

***Our indebtedness may limit our flexibility in operating our business and adversely affect our financial health and competitive position, and all of our obligations under our indebtedness are secured by substantially all of our assets, excluding our intellectual property and certain other assets. If we default on these obligations, our lenders could foreclose on our assets.***

In May 2019, we entered into the Loan Agreement with SVB and WestRiver. We borrowed $25.0 million, or Term Loan A, at the inception of the Loan Agreement and have the right to borrow an additional $25.0 million, or Term Loan B, and which we collectively refer to as the Term Loans. Term Loan B is available through March 31, 2020, provided that (i) we have received at least $150.0 million of net cash proceeds in connection with the issuance and sale, subsequent to April 1, 2019, of our equity securities and subordinated debt, (ii) we have initiated Phase 3 clinical trials for vonoprazan, and (iii) no event of default has occurred. All obligations under the Term Loans are secured by a first priority lien on substantially all of our assets, excluding intellectual property and certain other assets. We have agreed not to encumber our intellectual property assets without SVB's prior written consent unless a security interest in the underlying intellectual property is necessary to have a security interest in the accounts and proceeds that are part of the assets securing the Term Loans, in which case our intellectual property will automatically be included within the assets securing the Term Loans. As a result, if we default on any of our obligations under the Loan Agreement, SVB could foreclose on its security interest and liquidate some or all of the collateral, which would harm our business, financial condition and results of operations and could require us to reduce or cease operations.

In order to service this indebtedness and any additional indebtedness we may incur in the future, we need to generate cash from our operating activities. Our ability to generate cash is subject, in part, to our ability to successfully execute our business strategy, as well as general economic, financial, competitive, regulatory and other factors beyond our control. Our business may not be able to generate sufficient cash flow from operations, and future borrowings or other financings may not be available to us in an amount sufficient to enable us to service our indebtedness and fund our other liquidity needs. To the extent we are required to use cash from operations or the proceeds of any future financing to service our indebtedness instead of funding working capital, capital expenditures or other general corporate purposes, we will be less able to plan for, or react to, changes in our business, industry and in the economy generally. This could place us at a competitive disadvantage compared to our competitors that have less indebtedness.

The Loan Agreement contains customary affirmative and negative covenants that limit our ability to engage in certain transactions that may be in our long-term best interest. The affirmative covenants

include, among others, covenants requiring us to maintain our legal existence and governmental approvals, deliver certain financial reports, maintain insurance coverage and satisfy certain requirements regarding our operating accounts. The negative covenants include, among others, limitations on our ability to incur additional indebtedness and liens, merge with other companies or consummate certain changes of control, acquire other companies, engage in new lines of business, make certain investments, pay dividends, transfer or dispose of assets, amend certain material agreements or enter into various specified transactions.

While we believe we are currently in compliance with the covenants contained in the Loan Agreement, we may breach these covenants in the future. Our ability to comply with these covenants may be affected by events and factors beyond our control. In the event that we breach one or more covenants, the lenders may choose to declare an event of default and require that we immediately repay all amounts outstanding under the Loan Agreement, terminate any commitment to extend further credit and foreclose on the collateral. The occurrence of any of these events could have a material adverse effect on our business, financial condition and results of operations.

***We are dependent on the services of our current management and other clinical and scientific personnel, and if we are not able to retain these individuals or recruit additional management or clinical and scientific personnel, our business will suffer.***

Our success depends in part on our continued ability to attract, retain and motivate highly qualified management, clinical and scientific personnel. We are highly dependent upon our current senior management team, our Chairman and our development personnel. The loss of services of any of these individuals or personnel could delay or prevent the successful development of our product pipeline, initiation or completion of our planned clinical trials or the commercialization of vonoprazan or any other future product candidates. Although we have executed employment agreements or offer letters with each member of our senior management team, these agreements are terminable at will with or without notice and, therefore, we may not be able to retain their services as expected. We do not currently maintain “key person” life insurance on the lives of our executives or any of our employees. This lack of insurance means that we may not have adequate compensation for the loss of the services of these individuals.

In addition, we expect that Terrie Curran, a member of our board of directors, will become our Chief Executive Officer effective upon the closing of the acquisition of her current employer, Celgene Corporation, by Bristol-Myers Squibb Company. In the event Ms. Curran succeeds Mr. Socks as Chief Executive Officer, Mr. Socks will serve as interim Chief Financial Officer and continue to serve on our board of directors. If Ms. Curran decides not to join us as Chief Executive Officer, our board of directors will evaluate additional candidates for the position, during which time David Socks will continue to serve as our Chief Executive Officer. Although this is a planned management transition, we may experience business disruptions and our ability to achieve our development objections could be adversely affected.

We will continue to expand and need to effectively manage our managerial, operational, financial and other resources in order to successfully pursue our clinical development and commercialization efforts. We may not be successful in maintaining our unique company culture and continuing to attract or retain qualified management and scientific and clinical personnel in the future due to the intense competition for qualified personnel among pharmaceutical, biotechnology and other businesses. Our industry has experienced a high rate of turnover of management personnel in recent years. If we are not able to attract, integrate, retain and motivate necessary personnel to accomplish our business objectives, we may experience constraints that will significantly impede the achievement of our development objectives, our ability to raise additional capital and our ability to implement our business strategy.

***We have recently substantially increased the size of our organization, and we may encounter difficulties in managing our growth and expanding our operations successfully.***

We have substantially increased our organization from four employees in February 2018 to 16 full-time employees as of September 30, 2019. As we continue development and pursue the potential commercialization of vonoprazan and any future product candidates, as well as function as a public company, we will continue to expand our financial, development, regulatory, manufacturing, marketing and sales capabilities or contract with third parties to provide these capabilities for us. As our operations expand, we expect that we will need to manage additional relationships with various strategic partners, suppliers and other third parties. Our future financial performance and our ability to develop and commercialize vonoprazan and any future product candidates and to compete effectively will depend, in part, on our ability to manage our recent substantial growth and any future growth effectively.

***We are subject to various foreign, federal, and state healthcare and privacy laws and regulations, and our failure to comply with these laws and regulations could harm our results of operations and financial condition.***

Our business operations and current and future arrangements with investigators, healthcare professionals, consultants, third-party payors, patient organizations and customers expose us to broadly applicable foreign, federal and state fraud and abuse and other healthcare and privacy laws and regulations. These laws may constrain the business or financial arrangements and relationships through which we conduct our operations, including how we research, market, sell and distribute any products for which we obtain marketing approval. Such laws include, but are not limited to:

- the U.S. federal Anti-Kickback Statute, which prohibits, among other things, persons or entities from knowingly and willfully soliciting, offering, receiving or providing any remuneration (including any kickback, bribe or certain rebates), directly or indirectly, overtly or covertly, in cash or in kind, to induce or reward, or in return for, either the referral of an individual for, or the purchase, lease, or order, or arranging for or recommending the purchase, lease, or order of any good, facility, item or service, for which payment may be made, in whole or in part, under any U.S. federal healthcare program, such as Medicare and Medicaid. A person or entity does not need to have actual knowledge of the federal Anti-Kickback Statute or specific intent to violate it in order to have committed a violation. In addition, the government may assert that a claim including items or services resulting from a violation of the federal Anti-Kickback Statute constitutes a false or fraudulent claim for purposes of the civil False Claims Act;
- the U.S. civil and criminal federal false claims and civil monetary penalties laws, including the civil False Claims Act, which can be enforced through civil whistleblower or qui tam actions, which prohibit, among other things, individuals or entities from knowingly presenting, or causing to be presented, to the federal government, claims for payment or approval that are false or fraudulent, knowingly making, using or causing to be made or used, a false record or statement material to a false or fraudulent claim, or from knowingly making or causing to be made a false statement to avoid, decrease or conceal an obligation to pay money to the U.S. federal government;
- the U.S. federal Health Insurance Portability and Accountability Act of 1996, or HIPAA, which imposes criminal and civil liability for, among other things, knowingly and willfully executing, or attempting to execute, a scheme to defraud any healthcare benefit program, or knowingly and willfully falsifying, concealing or covering up a material fact or making any materially false statement, in connection with the delivery of, or payment for, healthcare benefits, items or services. Similar to the U.S. federal Anti-Kickback Statute, a person or entity does not need to have actual knowledge of the healthcare fraud statute implemented under HIPAA or specific intent to violate it in order to have committed a violation;

- HIPAA, as amended by the Health Information Technology for Economic and Clinical Health Act of 2009, or HITECH, and its implementing regulations, also impose obligations, including mandatory contractual terms, with respect to safeguarding the privacy, security and transmission of individually identifiable health information of covered entities subject to the rule, such as health plans, healthcare clearinghouses and certain healthcare providers as well as their business associates that perform certain services for or on their behalf involving the use or disclosure of individually identifiable health information;
- the U.S. federal Physician Payments Sunshine Act, which requires certain manufacturers of drugs, devices, biologics and medical supplies for which payment is available under Medicare, Medicaid or the Children's Health Insurance Program (with certain exceptions) to report annually to the Centers for Medicare & Medicaid Services, or CMS, information related to certain payments and other "transfers of value" made to physicians (defined to include doctors, dentists, optometrists, podiatrists and chiropractors) and teaching hospitals, as well as ownership and investment interests held by the physicians described above and their immediate family members; and
- analogous state and foreign laws and regulations, such as state anti-kickback and false claims laws, which may apply to our business practices, including but not limited to, research, distribution, sales and marketing arrangements and claims involving healthcare items or services reimbursed by non-governmental third-party payors, including private insurers, or by the patients themselves; state laws that require pharmaceutical companies to comply with the pharmaceutical industry's voluntary compliance guidelines and the relevant compliance guidance promulgated by the federal government, or otherwise restrict payments that may be made to healthcare providers and other potential referral sources; state laws and regulations that require drug manufacturers to file reports relating to pricing and marketing information or which require tracking gifts and other remuneration and items of value provided to physicians, other healthcare providers and entities; state and local laws that require the registration of pharmaceutical sales representatives; state and foreign laws governing the privacy and security of health information in some circumstances, many of which differ from each other in significant ways and often are not preempted by HIPAA; state and foreign governments that have enacted or proposed requirements regarding the collection, distribution, use, security, and storage of personally identifiable information and other data relating to individuals (including the EU General Data Protection Regulation 2016/679, or GDPR, and the California Consumer Privacy Act, or CCPA), and federal and state consumer protection laws are being applied to enforce regulations related to the online collection, use, and dissemination of data, thus complicating compliance efforts.

We may also be subject to additional regulation in the conduct of our business. For example, we may be subject to the U.S. Foreign Corrupt Practices Act of 1977, as amended, which prohibits, among other things, U.S. companies and their employees and agents from authorizing, promising, offering, or providing, directly or indirectly, corrupt or improper payments or anything else of value to foreign government officials, employees of public international organizations and foreign government owned or affiliated entities, candidates for foreign political office, and foreign political parties or officials thereof.

In addition, California recently enacted the CCPA, which creates new individual privacy rights for California consumers (as defined in the law) and places increased privacy and security obligations on entities handling certain personal data of consumers or households. The CCPA will require covered companies to provide new disclosure to consumers about such companies' data collection, use and sharing practices, provide such consumers new ways to opt-out of certain sales or transfers of personal information, and provide consumers with additional causes of action. The CCPA goes into effect on January 1, 2020, and the California Attorney General may bring enforcement actions for violations beginning July 1, 2020. The CCPA was amended on September 23, 2018, and it remains

unclear what, if any, further modifications will be made to this legislation or how it will be interpreted. As currently written, the CCPA may impact our business activities and exemplifies the vulnerability of our business to the evolving regulatory environment related to personal data and protected health information.

Ensuring that our internal operations and business arrangements with third parties comply with applicable healthcare laws and regulations could involve substantial costs. It is possible that governmental authorities will conclude that our business practices do not comply with current or future statutes, regulations, agency guidance or case law involving applicable fraud and abuse or other healthcare laws and regulations. If our operations are found to be in violation of any of the laws described above or any other governmental laws and regulations that may apply to us, we may be subject to significant penalties, including civil, criminal and administrative penalties, damages, fines, exclusion from U.S. government funded healthcare programs, such as Medicare and Medicaid, or similar programs in other countries or jurisdictions, disgorgement, imprisonment, contractual damages, reputational harm, additional reporting requirements and oversight if we become subject to a corporate integrity agreement or similar agreement to resolve allegations of non-compliance with these laws, diminished profits and the curtailment or restructuring of our operations. Further, defending against any such actions can be costly, time consuming and may require significant financial and personnel resources. Therefore, even if we are successful in defending against any such actions that may be brought against us, our business may be impaired. If any of the physicians or other providers or entities with whom we expect to do business are found not to be in compliance with applicable laws, they may be subject to significant criminal, civil or administrative sanctions, including exclusion from government funded healthcare programs and imprisonment. If any of the above occur, it could adversely affect our ability to operate our business and our results of operations.

***Enacted and future legislation and healthcare reform measures may increase the difficulty and cost for us to obtain marketing approval for and commercialize vonoprazan and any future product candidates and may affect the prices we may set.***

In the United States and some foreign jurisdictions, there have been, and we expect there will continue to be, a number of legislative and regulatory changes and proposed changes to the healthcare system, including cost-containment measures that may reduce or limit coverage and reimbursement for newly approved drugs and affect our ability to profitably sell any product candidates for which we obtain marketing approval. In particular, there have been and continue to be a number of initiatives at the U.S. federal and state levels that seek to reduce healthcare costs and improve the quality of healthcare.

For example, in March 2010, the Patient Protection and Affordable Care Act, as amended by the Health Care and Education Reconciliation Act, collectively the Affordable Care Act, was enacted in the United States. Among the provisions of the Affordable Care Act of importance to our potential product candidates, the Affordable Care Act includes:

- an annual, nondeductible fee on any entity that manufactures or imports specified branded prescription drugs and biologic agents, which is apportioned among these entities according to their market share in certain government healthcare programs;
- a Medicare Part D coverage gap discount program, in which manufacturers must agree to offer point-of-sale discounts off negotiated prices of applicable brand drugs to eligible beneficiaries during their coverage gap period, as a condition for the manufacturer’s outpatient drugs to be covered under Medicare Part D;
- an increase in the statutory minimum rebates a manufacturer must pay under the Medicaid Drug Rebate Program to 23.1% and 13.0% of the average manufacturer price for branded and generic drugs, respectively;

- a methodology by which rebates owed by manufacturers under the Medicaid Drug Rebate Program are calculated for drugs that are inhaled, infused, instilled, implanted or injected;
- an extension of a manufacturers' Medicaid rebate liability to covered drugs dispensed to individuals who are enrolled in Medicaid managed care organizations;
- expansion of the entities eligible for discounts under the Public Health Service pharmaceutical pricing program;
- a new Patient-Centered Outcomes Research Institute to oversee, identify priorities in and conduct comparative clinical effectiveness research, along with funding for such research; and
- establishment of a Center for Medicare Innovation at CMS to test innovative payment and service delivery models to lower Medicare and Medicaid spending, potentially including prescription drug spending.

Since its enactment, there have been judicial and political challenges to certain aspects of the Affordable Care Act, and we expect there will be additional challenges and amendments to the Affordable Care Act in the future. For example, the Tax Cuts and Jobs Act of 2017, or Tax Act, includes a provision repealing, effective January 1, 2019, the tax-based shared responsibility payment imposed by the Affordable Care Act on certain individuals who fail to maintain qualifying health coverage for all or part of a year that is commonly referred to as the "individual mandate." On December 14, 2018, a U.S. District Court Judge in the Northern District of Texas, or Texas District Court Judge, ruled that the individual mandate is a critical and inseverable feature of the Affordable Care Act, and therefore, because it was repealed as part of the Tax Act, the remaining provisions of the Affordable Care Act are invalid as well. While the Texas District Court Judge, as well as the Trump Administration and CMS, have stated that the ruling will have no immediate effect, it is unclear how this decision, subsequent appeals, and other efforts to repeal and replace the Affordable Care Act will impact the Affordable Care Act and our business.

In addition, other legislative changes have been proposed and adopted since the Affordable Care Act was enacted. These changes included aggregate reductions to Medicare payments to providers of 2% per fiscal year, which went into effect on April 1, 2013 and, due to subsequent legislative amendments to the statute, including the Bipartisan Budget Act of 2018, will remain in effect through 2027 unless additional Congressional action is taken. On January 2, 2013, the American Taxpayer Relief Act of 2012 was signed into law, which, among other things, reduced Medicare payments to several providers, including hospitals, and increased the statute of limitations period for the government to recover overpayments to providers from three to five years.

Further, there has been heightened governmental scrutiny in the United States of pharmaceutical pricing practices in light of the rising cost of prescription drugs. Such scrutiny has resulted in several recent congressional inquiries and proposed and enacted federal and state legislation designed to, among other things, bring more transparency to product pricing, review the relationship between pricing and manufacturer patient programs, and reform government program reimbursement methodologies for products.

At the federal level, the Trump administration's budget proposal for fiscal year 2019 contains further drug price control measures that could be enacted during the 2019 budget process or in other future legislation, including, for example, measures to permit Medicare Part D plans to negotiate the price of certain drugs under Medicare Part B, to allow some states to negotiate drug prices under Medicaid and to eliminate cost sharing for generic drugs for low-income patients. While proposed measures will require authorization through additional legislation to become effective, Congress and the Trump administration have each indicated that it will continue to seek new legislative and/or administrative measures to control drug costs.

At the state level, legislatures have increasingly passed legislation and implemented regulations designed to control pharmaceutical and biological product pricing, including price or patient reimbursement constraints, discounts, restrictions on certain product access and marketing cost disclosure and transparency measures, and, in some cases, designed to encourage importation from other countries and bulk purchasing. In addition, regional healthcare authorities and individual hospitals are increasingly using bidding procedures to determine what pharmaceutical products and which suppliers will be included in their prescription drug and other healthcare programs. Furthermore, there has been increased interest by third party payors and governmental authorities in reference pricing systems and publication of discounts and list prices. These reforms could reduce the ultimate demand for vonoprazan and any future product candidates, if approved, or put pressure on our product pricing, which could negatively affect our business, results of operations, financial condition and prospects.

Additionally, on May 30, 2018, the Trickett Wendler, Frank Mongiello, Jordan McLinn, and Matthew Bellina Right to Try Act of 2017, or Right to Try Act, was signed into law. The law, among other things, provides a federal framework for certain patients to access certain investigational new drug products that have completed a Phase 1 clinical trial. Under certain circumstances, eligible patients can seek treatment without enrolling in clinical trials and without obtaining FDA permission under the FDA expanded access program. There is no obligation for a drug manufacturer to make its drug products available to eligible patients as a result of the Right to Try Act.

We expect that these new laws and other healthcare reform measures that may be adopted in the future may result in more rigorous coverage criteria, new payment methodologies and additional downward pressure on the price that we receive for any approved product. Any reduction in reimbursement from Medicare or other government programs may result in a similar reduction in payments from private payors. The implementation of cost containment measures or other healthcare reforms may prevent us from being able to generate revenue, attain profitability or commercialize vonoprazan and any future product candidates, if approved.

***We and any of our third-party manufacturers or suppliers may use potent chemical agents and hazardous materials, and any claims relating to improper handling, storage or disposal of these materials could be time consuming or costly.***

We and any of our third-party manufacturers or suppliers will use biological materials, potent chemical agents and may use hazardous materials, including chemicals and biological agents and compounds that could be dangerous to human health and safety of the environment. Our operations and the operations of our third-party manufacturers and suppliers also produce hazardous waste products. Federal, state and local laws and regulations govern the use, generation, manufacture, storage, handling and disposal of these materials and wastes. Compliance with applicable environmental laws and regulations may be expensive, and current or future environmental laws and regulations may impair our product development efforts. In addition, we cannot eliminate the risk of accidental injury or contamination from these materials or wastes. We do not carry specific biological or hazardous waste insurance coverage, and our property, casualty and general liability insurance policies specifically exclude coverage for damages and fines arising from biological or hazardous waste exposure or contamination. In the event of contamination or injury, we could be held liable for damages or be penalized with fines in an amount exceeding our resources, and our clinical trials or regulatory approvals could be suspended.

Although we maintain workers' compensation insurance for certain costs and expenses we may incur due to injuries to our employees resulting from the use of hazardous materials or other work-related injuries, this insurance may not provide adequate coverage against potential liabilities. We do not maintain insurance for toxic tort claims that may be asserted against us in connection with our storage or disposal of biologic, hazardous or radioactive materials.

In addition, we may incur substantial costs in order to comply with current or future environmental, health and safety laws and regulations, which have tended to become more stringent over time. These current or future laws and regulations may impair our research, development or production efforts. Failure to comply with these laws and regulations also may result in substantial fines, penalties or other sanctions or liabilities, which could materially adversely affect our business, financial condition, results of operations and prospects.

***If product liability lawsuits are brought against us, we may incur substantial liabilities and may be required to limit commercialization of our products.***

We face an inherent risk of product liability as a result of the clinical trials of vonoprazan and any future product candidates and will face an even greater risk if we commercialize vonoprazan and any future product candidates. For example, we may be sued if vonoprazan and any future product candidates allegedly cause injury or are found to be otherwise unsuitable during product testing, manufacturing, marketing or sale. Any such product liability claims may include allegations of defects in manufacturing, defects in design, a failure to warn of dangers inherent in the product candidate, negligence, strict liability and a breach of warranties. Claims may be brought against us by clinical trial participants, patients or others using, administering or selling products that may be approved in the future. Claims could also be asserted under state consumer protection acts.

If we cannot successfully defend ourselves against product liability claims, we may incur substantial liabilities or be required to limit or cease the commercialization of our products. Even a successful defense would require significant financial and management resources. Regardless of the merits or eventual outcome, liability claims may result in:

- decreased demand for our products;
- injury to our reputation and significant negative media attention;
- withdrawal of clinical trial participants;
- costs to defend the related litigation;
- a diversion of management's time and our resources;
- substantial monetary awards to trial participants or patients;
- product recalls, withdrawals or labeling, marketing or promotional restrictions;
- significant negative financial impact;
- the inability to commercialize vonoprazan and any future product candidates; and
- a decline in our stock price.

We currently do not have product liability insurance coverage, but will need to obtain such coverage as we begin our clinical trials or if we commence commercialization of vonoprazan and any future product candidates. Insurance coverage is increasingly expensive. Our inability to obtain and retain sufficient product liability insurance at an acceptable cost to protect against potential product liability claims could prevent or inhibit the commercialization of vonoprazan and any future product candidates. Although we plan to maintain such insurance, any claim that may be brought against us could result in a court judgment or settlement in an amount that is not covered, in whole or in part, by our insurance or that is in excess of the limits of our insurance coverage. Our insurance policies will also have various exclusions, and we may be subject to a product liability claim for which we have no coverage. We may have to pay any amounts awarded by a court or negotiated in a settlement that exceed our coverage limitations or that are not covered by our insurance, and we may not have, or be able to obtain, sufficient capital to pay such amounts.

***We and others, including any of our potential future collaborators, will be required to report to regulatory authorities if any of our approved products cause or contribute to adverse medical events, and any failure to do so would result in sanctions that would materially harm our business.***

If we or any of our potential future collaborators are successful in commercializing vonoprazan or any future product candidates, the FDA and foreign regulatory authorities would require that we and Takeda (with respect to vonoprazan) and any of our current or potential future collaborators, report certain information about adverse medical events if those products may have caused or contributed to those adverse events. The timing of our obligation to report would be triggered by the date we become aware of the adverse event as well as the nature of the event. We, Takeda and any of our potential future collaborators or CROs may fail to report adverse events within the prescribed timeframe. If we, Takeda or any of our potential future collaborators or CROs fail to comply with such reporting obligations, the FDA or a foreign regulatory authority could take action, including criminal prosecution, the imposition of civil monetary penalties, seizure of our products or delay in approval or clearance of future products.

***Our internal computer systems, or those of any of our CROs, manufacturers, other contractors or consultants or potential future collaborators, may fail or suffer security breaches, which could result in a material disruption of our product development programs.***

The United States federal and various state and foreign governments have adopted or proposed requirements regarding the collection, distribution, use, security, and storage of personally identifiable information and other data relating to individuals, and federal and state consumer protection laws are being applied to enforce regulations related to the online collection, use, and dissemination of data. Despite the implementation of security measures, our internal computer systems and those of our current and any future CROs and other contractors, consultants and collaborators are vulnerable to damage from computer viruses, cybersecurity threats, unauthorized access, natural disasters, terrorism, war and telecommunication and electrical failures. If such an event were to occur and cause interruptions in our operations or result in the unauthorized disclosure of or access to personally identifiable information or individually identifiable health information (violating certain privacy laws such as GDPR), it could result in a material disruption of our development programs and our business operations, whether due to a loss of our trade secrets or other similar disruptions. Some of the federal, state and foreign government requirements include obligations of companies to notify individuals of security breaches involving particular personally identifiable information, which could result from breaches experienced by us or by our vendors, contractors, or organizations with which we have formed strategic relationships. Even though we may have contractual protections with such vendors, contractors, or other organizations, notifications and follow-up actions related to a security breach could impact our reputation, cause us to incur significant costs, including legal expenses, harm customer confidence, hurt our expansion into new markets, cause us to incur remediation costs, or cause us to lose existing customers. For example, the loss of clinical trial data from completed or future clinical trials could result in delays in our regulatory approval efforts and significantly increase our costs to recover or reproduce the data. We also rely on third parties to manufacture vonoprazan and any future product candidates, and similar events relating to their computer systems could also have a material adverse effect on our business. To the extent that any disruption or security breach were to result in a loss of, or damage to, our data or applications, or inappropriate disclosure of confidential or proprietary information, we could incur liability, the further development and commercialization of vonoprazan and any future product candidates could be delayed, and we could be subject to significant fines, penalties or liabilities for any noncompliance to certain privacy and security laws.

***Business disruptions could seriously harm our future revenue and financial condition and increase our costs and expenses.***

Our operations could be subject to earthquakes, power shortages, telecommunications failures, water shortages, floods, hurricanes, typhoons, fires, extreme weather conditions, medical epidemics and other natural or manmade disasters or business interruptions, for which we are predominantly self-insured. We rely on third-party manufacturers to produce vonoprazan and any future product candidates. Our ability to obtain clinical supplies of vonoprazan and any future product candidates could be disrupted if the operations of these suppliers were affected by a man-made or natural disaster or other business interruption. The occurrence of any of these business disruptions could seriously harm our operations and financial condition and increase our costs and expenses.

***Our employees and independent contractors, including principal investigators, CROs, consultants and vendors, may engage in misconduct or other improper activities, including noncompliance with regulatory standards and requirements.***

We are exposed to the risk that our employees and independent contractors, including principal investigators, CROs, consultants and vendors may engage in misconduct or other illegal activity. Misconduct by these parties could include intentional, reckless and/or negligent conduct or other unauthorized activities that violate: (i) the laws and regulations of the FDA and other similar regulatory bodies, including those laws that require the reporting of true, complete and accurate information to such regulatory bodies, (ii) manufacturing standards, including cGMP requirements, or (iii) federal and state healthcare, security, fraud and abuse laws, data privacy and security laws, and other similar non-U.S. laws that require the true, complete and accurate reporting of financial information or data. Activities subject to these laws also involve the improper use or misrepresentation of information obtained in the course of clinical trials, the creation of fraudulent data in our preclinical studies or clinical trials, or illegal misappropriation of product, which could result in regulatory sanctions and cause serious harm to our reputation. It is not always possible to identify and deter misconduct by employees and other third parties, and the precautions we take to detect and prevent this activity may not be effective in controlling unknown or unmanaged risks or losses or in protecting us from governmental investigations or other actions or lawsuits stemming from a failure to be in compliance with such laws or regulations. In addition, we are subject to the risk that a person or government could allege such fraud or other misconduct, even if none occurred. If any such actions are instituted against us, and we are not successful in defending ourselves or asserting our rights, those actions could have a significant impact on our business and financial results, including, without limitation, the imposition of significant civil, criminal and administrative penalties, damages, monetary fines, disgorgement, possible exclusion from participation in Medicare, Medicaid and other U.S. federal healthcare programs or healthcare programs in other jurisdictions, integrity oversight and reporting obligations to resolve allegations of non-compliance, imprisonment, contractual damages, reputational harm, diminished profits and future earnings, and curtailment of our operations, any of which could adversely affect our ability to operate our business and our results of operations.

***We are subject to U.S. and certain foreign export and import controls, sanctions, embargoes, anti-corruption laws and anti-money laundering laws and regulations. Compliance with these legal standards could impair our ability to compete in domestic and international markets. We could face criminal liability and other serious consequences for violations, which could harm our business.***

We are subject to export control and import laws and regulations, including the U.S. Export Administration Regulations, U.S. Customs regulations, and various economic and trade sanctions regulations administered by the U.S. Treasury Department’s Office of Foreign Assets Controls, and anti-corruption and anti-money laundering laws and regulations, including the U.S. Foreign Corrupt

Practices Act of 1977, as amended, the U.S. domestic bribery statute contained in 18 U.S.C. § 201, the U.S. Travel Act, the USA PATRIOT Act, and other state and national anti-bribery and anti-money laundering laws in the countries in which we conduct activities. Anti-corruption laws are interpreted broadly and prohibit companies and their employees, agents, clinical research organizations, contractors and other collaborators and partners from authorizing, promising, offering, providing, soliciting or receiving, directly or indirectly, improper payments or anything else of value to recipients in the public or private sector. We may engage third parties for clinical trials outside of the United States, to sell our products abroad once we enter a commercialization phase, and/or to obtain necessary permits, licenses, patent registrations and other regulatory approvals. We have direct or indirect interactions with officials and employees of government agencies or government-affiliated hospitals, universities and other organizations. We can be held liable for the corrupt or other illegal activities of our employees, agents, clinical research organizations, contractors and other collaborators and partners, even if we do not explicitly authorize or have actual knowledge of such activities. Any violations of the laws and regulations described above may result in substantial civil and criminal fines and penalties, imprisonment, the loss of export or import privileges, debarment, tax reassessments, breach of contract and fraud litigation, reputational harm and other consequences.

***We may engage in strategic transactions that could impact our liquidity, increase our expenses and present significant distractions to our management.***

From time to time, we may consider strategic transactions, such as acquisitions of companies, asset purchases and out-licensing or in-licensing of intellectual property, products or technologies, similar to our approach in in-licensing and acquiring our current product candidates. Any future transactions could increase our near and long-term expenditures, result in potentially dilutive issuances of our equity securities, including our common stock, or the incurrence of debt, contingent liabilities, amortization expenses or acquired in-process research and development expenses, any of which could affect our financial condition, liquidity and results of operations. Additional potential transactions that we may consider in the future include a variety of business arrangements, including spin-offs, strategic partnerships, joint ventures, restructurings, divestitures, business combinations and investments. Future acquisitions may also require us to obtain additional financing, which may not be available on favorable terms or at all. These transactions may never be successful and may require significant time and attention of management. In addition, the integration of any business that we may acquire in the future may disrupt our existing business and may be a complex, risky and costly endeavor for which we may never realize the full benefits of the acquisition. Accordingly, although we may not undertake or successfully complete any additional transactions of the nature described above, any additional transactions that we do complete could have a material adverse effect on our business, results of operations, financial condition and prospects.

**Risks Related to Our Intellectual Property**

***Our success depends on our ability to protect our intellectual property and our proprietary technologies.***

Our commercial success depends in part on our ability to obtain and maintain patent protection and trade secret protection for vonoprazan and any future product candidates, proprietary technologies and their uses as well as our ability to operate without infringing upon the proprietary rights of others. If we are unable to protect our intellectual property rights or if our intellectual property rights are inadequate for our technology or vonoprazan or any future product candidates, our competitive position could be harmed. We generally seek to protect our proprietary position by filing patent applications in the United States and abroad related to vonoprazan or any future product candidates, proprietary technologies and their uses that are important to our business. We do not currently own any issued patents or pending patent applications. We also seek to protect our proprietary position by acquiring or

in-licensing relevant issued patents or pending patent applications from third parties. We have in-licensed from Takeda a number of United States, European, and Canadian patents and patent applications relating to the compound vonoprazan as well as the use and manufacture of vonoprazan products.

Pending patent applications cannot be enforced against third parties practicing the technology claimed in such applications unless, and until, patents issue from such applications, and then only to the extent the issued claims cover the technology. There can be no assurance that our future patent applications or the patent applications of our current and future licensors will result in patents being issued or that issued patents will afford sufficient protection against competitors with similar technology, nor can there be any assurance that the patents if issued will not be infringed, designed around or invalidated by third parties.

Even issued patents may later be found invalid or unenforceable or may be modified or revoked in proceedings instituted by third parties before various patent offices or in courts. The degree of future protection for our proprietary rights is uncertain. Only limited protection may be available and may not adequately protect our rights or permit us to gain or keep any competitive advantage. These uncertainties and/or limitations in our ability to properly protect the intellectual property rights relating to vonoprazan and any future product candidates could have a material adverse effect on our financial condition and results of operations.

We cannot be certain that the claims in our licensor's U.S. pending patent applications, corresponding international patent applications and patent applications in certain foreign countries will be considered patentable by the United States Patent and Trademark Office, or USPTO, courts in the United States or by the patent offices and courts in foreign countries, nor can we be certain that the claims in our licensor's issued patents will not be found invalid or unenforceable if challenged.

The patent application process is subject to numerous risks and uncertainties, and there can be no assurance that we or any of our potential future collaborators will be successful in protecting vonoprazan and any future product candidates by obtaining and defending patents. These risks and uncertainties include the following:

- the USPTO and various foreign governmental patent agencies require compliance with a number of procedural, documentary, fee payment and other provisions during the patent process, the noncompliance with which can result in abandonment or lapse of a patent or patent application, and partial or complete loss of patent rights in the relevant jurisdiction;
- patent applications may not result in any patents being issued;
- patents may be challenged, invalidated, modified, revoked, circumvented, found to be unenforceable or otherwise may not provide any competitive advantage;
- our competitors, many of whom have substantially greater resources than we do and many of whom have made significant investments in competing technologies, may seek or may have already obtained patents that will limit, interfere with or block our ability to make, use and sell vonoprazan and any future product candidates;
- there may be significant pressure on the U.S. government and international governmental bodies to limit the scope of patent protection both inside and outside the United States for disease treatments that prove successful, as a matter of public policy regarding worldwide health concerns; and
- countries other than the United States may have patent laws less favorable to patentees than those upheld by U.S. courts, allowing foreign competitors a better opportunity to create, develop and market competing products.

The patent prosecution process is also expensive and time consuming, and we and our licensor may not be able to file and prosecute all necessary or desirable patent applications at a reasonable cost or in a timely manner or in all jurisdictions where protection may be commercially advantageous. It is also possible that we and our licensor will fail to identify patentable aspects of our research and development output before it is too late to obtain patent protection. Moreover, in some circumstances such as under the Takeda License, we do not have the right to control the preparation, filing and prosecution of patent applications, or to maintain the patents, directed to technology that we license from third parties. We may also require the cooperation of our licensors in order to enforce the licensed patent rights, and such cooperation may not be provided. Therefore, these patents and applications may not be prosecuted and enforced in a manner consistent with the best interests of our business. We cannot be certain that patent prosecution and maintenance activities by our licensors have been or will be conducted in compliance with applicable laws and regulations, which may affect the validity and enforceability of such patents or any patents that may issue from such applications. If they fail to do so, this could cause us to lose rights in any applicable intellectual property that we in-license, and as a result our ability to develop and commercialize products or product candidates may be adversely affected and we may be unable to prevent competitors from making, using and selling competing products.

In addition, although we enter into non-disclosure and confidentiality agreements with parties who have access to patentable aspects of our research and development output, such as our employees, outside scientific collaborators, CROs, third-party manufacturers, consultants, advisors and other third parties, any of these parties may breach such agreements and disclose such output before a patent application is filed, thereby jeopardizing our ability to seek patent protection.

***If we fail to comply with our obligations in the agreements under which we license intellectual property rights from third parties, including our rights in vonoprazan licensed from Takeda, or otherwise experience disruptions to our business relationships with our licensors, we could lose license rights that are important to our business.***

We are a party to the Takeda License under which we are granted rights to intellectual property that are important to our business and we may enter into additional license agreements in the future with other third parties. The Takeda License imposes, and we expect that any future license agreements where we in-license intellectual property, will impose on us, various development, regulatory and/or commercial diligence obligations, payment of milestones and/or royalties and other obligations. If we fail to comply with our obligations under these agreements, or we are subject to bankruptcy-related proceedings, the licensor may have the right to terminate the license, in which event we would not be able to market products covered by the license. Additionally, if a future license agreement includes a sublicense from a third party who is not the original licensor of the intellectual property at issue, then we must rely on our direct licensor to comply with its obligations under the primary license agreements under which such licensor obtained rights in the applicable intellectual property, where we may have no relationship with the original licensor of such rights. If such a licensor fails to comply with its obligations under its upstream license agreement, the original third-party licensor may have the right to terminate the original license, which may terminate our sublicense. If this were to occur, we would no longer have rights to the applicable intellectual property unless we are able to secure our own direct license with the owner of the relevant rights, which we may not be able to do on reasonable terms, or at all, which may impact our ability to continue to develop and commercialize vonoprazan and any future product candidates incorporating the relevant intellectual property.

We may need to obtain further licenses from third parties to advance our research or allow commercialization of vonoprazan and any future product candidates, and we cannot provide any assurances that third-party patents do not exist which might be enforced against vonoprazan and any future product candidates in the absence of such a license. We may fail to obtain any of these licenses

on commercially reasonable terms, if at all. Even if we are able to obtain a license, it may be non-exclusive, thereby giving our competitors access to the same technologies licensed to us. In that event, we may be required to expend significant time and resources to develop or license replacement technology. If we are unable to do so, we may be unable to develop or commercialize the affected product candidates, which could materially harm our business and the third parties owning such intellectual property rights could seek either an injunction prohibiting our sales, or, with respect to our sales, an obligation on our part to pay royalties and/or other forms of compensation.

Licensing of intellectual property is of critical importance to our business and involves complex legal, business and scientific issues. Disputes may arise between us and our licensors regarding intellectual property subject to a license agreement, including:

- the scope of rights granted under the license agreement and other interpretation-related issues;
- whether and the extent to which our technology and processes infringe on intellectual property of the licensor that is not subject to the licensing agreement;
- our right to sublicense patents and other rights to third parties;
- our diligence obligations with respect to the use of the licensed technology in relation to our development and commercialization of vonoprazan and any future product candidates, and what activities satisfy those diligence obligations;
- our right to transfer or assign the license; and
- the ownership of inventions and know-how resulting from the joint creation or use of intellectual property by our licensors and us and our partners.

If disputes over intellectual property that we have licensed prevent or impair our ability to maintain our current licensing arrangements on acceptable terms, we may not be able to successfully develop and commercialize the affected product candidates, which would have a material adverse effect on our business.

In addition, certain of our agreements may limit or delay our ability to consummate certain transactions, may impact the value of those transactions, or may limit our ability to pursue certain activities. For example, if we choose to sublicense or assign to any third parties our rights under our existing license agreement with Takeda with respect to any licensed product, we may be required to wait for a certain period or until the occurrence of certain funding or development milestones.

***If the scope of any patent protection we obtain is not sufficiently broad, or if we lose any of our patent protection, our ability to prevent our competitors from commercializing similar or identical product candidates would be adversely affected.***

The patent position of biopharmaceutical companies generally is highly uncertain, involves complex legal and factual questions, and has been the subject of much litigation in recent years. As a result, the issuance, scope, validity, enforceability and commercial value of our patent rights are highly uncertain. Our in-licensed pending and future patent applications may not result in patents being issued which protect vonoprazan or any future product candidates or which effectively prevent others from commercializing competitive product candidates.

Moreover, the coverage claimed in a patent application can be significantly reduced before the patent is issued, and its scope can be reinterpreted after issuance. Even if patent applications we own in the future or license currently issue as patents, they may not issue in a form that will provide us with any meaningful protection, prevent competitors or other third parties from competing with us, or otherwise provide us with any competitive advantage. Any future patents that we own or license, now

or in the future, may be challenged or circumvented by third parties or may be narrowed or invalidated as a result of challenges by third parties. Consequently, we do not know whether vonoprazan or any future product candidates will be protectable or remain protected by valid and enforceable patents. Our competitors or other third parties may be able to circumvent our future patents or the patents of our current and future licensors by developing similar or alternative technologies or products in a non-infringing manner which could materially adversely affect our business, financial condition, results of operations and prospects.

The issuance of a patent is not conclusive as to its inventorship, scope, validity or enforceability, and our future patents or the patents of our current and future licensors may not cover vonoprazan or any future product candidates or may be challenged in the courts or patent offices in the United States and abroad. We may be subject to a third party pre-issuance submission of prior art to the USPTO, or become involved in opposition, derivation, revocation, reexamination, post-grant review, or PGR, and inter partes review, or IPR, or other similar proceedings in the USPTO or foreign patent offices challenging our patent rights. The outcome following legal assertions of invalidity and unenforceability is unpredictable. With respect to the validity question, for example, we cannot be certain that there is no invalidating prior art, of which we or our predecessors and the patent examiner were unaware during prosecution. There is no assurance that all potentially relevant prior art relating to our in-licensed patents and patent applications has been found. There is also no assurance that there is not prior art of which we, our predecessors or licensors are aware, but which we do not believe affects the validity or enforceability of a claim in our in-licensed patents and patent applications, which may, nonetheless, ultimately be found to affect the validity or enforceability of a claim. An adverse determination in any such submission, proceeding or litigation could reduce the scope of, or invalidate or render unenforceable, our patent rights, allow third parties to commercialize vonoprazan or any future product candidates and compete directly with us, without payment to us. It is possible that defects of form in the preparation or filing of our or our current and future licensors' patents or patent applications may exist, or may arise in the future, for example with respect to proper priority claims, inventorship, claim scope, or requests for patent term adjustments. If there are material defects in the form, preparation, prosecution, or enforcement of our future patents or future patent applications or our current and future licensors' patents or patent applications, such patents may be invalid and/or unenforceable, and such applications may never result in valid, enforceable patents.

Any loss of patent rights, loss of exclusivity or in patent claims being narrowed, invalidated or held unenforceable could limit our ability to stop others from using or commercializing similar or identical technology and products, or limit the duration of the patent protection of vonoprazan or any future product candidates, which could materially and adversely impact our business. Such proceedings also may result in substantial cost and require significant time from our scientists and management, even if the eventual outcome is favorable to us. In addition, if the breadth or strength of protection provided by our future patents and future patent applications or the patents and patent applications of our current and future licensors is threatened, regardless of the outcome, it could dissuade companies from collaborating with us to license, develop or commercialize vonoprazan or any future product candidates.

***The patent protection and patent prosecution for vonoprazan or any future product candidates may be dependent on third parties.***

We may rely on third parties to file and prosecute patent applications and maintain patents and otherwise protect the licensed intellectual property under certain current and future license agreements, such as the Takeda License. Under such arrangements, we may not have primary control over these activities for certain of licensed patents or patent applications and other intellectual property rights. We cannot be certain that such activities by third parties have been or will be conducted in compliance with applicable laws and regulations or will result in valid and enforceable patents or other

intellectual property rights. In addition, our current and future licensors may not be fully cooperative or disagree with us as to the prosecution, maintenance or enforcement of any patent rights, which could compromise such patent rights. We may in the future enter into license agreements where the licensors may have the right to control enforcement of our licensed patents or defense of any claims asserting the invalidity of these patents and even if we are permitted to pursue such enforcement or defense, we will require the cooperation of our licensors. We cannot be certain that our licensors will allocate sufficient resources or prioritize their or our enforcement of such patents or defense of such claims to protect our interests in the licensed patents. Even if we are not a party to these legal actions, an adverse outcome could harm our business because it might prevent us from continuing to license intellectual property that we may need to operate our business. If any of our licensors or any of our future licensors or future collaborators fail to appropriately prosecute and maintain patent protection for patents covering vonoprazan or any future product candidates, our ability to develop and commercialize those product candidates may be adversely affected and we may not be able to prevent competitors from making, using and selling competing products.

In addition, even where we have the right to control prosecution of patent applications or enforcement of patents we have acquired or licensed from third parties, we may still be adversely affected or prejudiced by actions or inactions of our predecessors or licensors and their counsel that took place prior to us assuming control over such activities.

Third parties may retain certain rights to the technology that they license to us, including the right to use the underlying technology for noncommercial academic and research use, to publish general scientific findings from research related to the technology, and to make customary scientific and scholarly disclosures of information relating to the technology. For example, under the Takeda License, Takeda retained the rights to the inventions in all countries other than the United States, Europe, and Canada. Takeda also retained the right to development certain drug products that contain vonoprazan where vonoprazan is not the only active pharmaceutical ingredient. It is difficult to monitor whether our predecessors or licensors limit their use of the technology to these uses, and we could incur substantial expenses to enforce our rights to our licensed technology in the event of misuse.

If we are limited in our ability to utilize acquired or licensed technologies, or if we lose our rights to critical in-licensed technology, we may be unable to successfully develop, out-license, market and sell our products, which could prevent or delay new product introductions. Our business strategy depends on the successful development of licensed and acquired technologies into commercial products. Therefore, any limitations on our ability to utilize these technologies may impair our ability to develop, out-license or market and sell our product candidate.

***Intellectual property rights do not necessarily address all potential threats to our competitive advantage.***

The degree of future protection afforded by our intellectual property rights is uncertain because intellectual property rights have limitations, and may not adequately protect our business or permit us to maintain our competitive advantage. For example:

- others may be able to develop products that are similar to vonoprazan or any future product candidates but that are not covered by the claims of the patents that we own in the future or license;
- we or our current and future licensors or predecessors might not have been the first to make the inventions covered by the issued patents or patent applications that we own in the future or license;
- we or our current and future licensors or predecessors might not have been the first to file patent applications covering certain of the claimed inventions;

- others may independently develop similar or alternative technologies or duplicate any of our technologies without infringing our intellectual property rights;
- it is possible that the pending patent applications we own or license will not lead to issued patents;
- issued patents that we own in the future or license may be held invalid or unenforceable, as a result of legal challenges by our competitors;
- our competitors might conduct research and development activities in countries where we do not have patent rights and then use the information learned from such activities to develop competitive products for sale in our major commercial markets;
- we may not develop additional proprietary technologies that are patentable; and
- the patents of others may have an adverse effect on our business.

Should any of these events occur, it could significantly harm our business, results of operations and prospects.

***Our commercial success depends significantly on our ability to operate without infringing the patents and other proprietary rights of third parties. Claims by third parties that we infringe their proprietary rights may result in liability for damages or prevent or delay our developmental and commercialization efforts.***

Our commercial success depends in part on avoiding infringement of the patents and proprietary rights of third parties. However, our research, development and commercialization activities may be subject to claims that we infringe or otherwise violate patents or other intellectual property rights owned or controlled by third parties. Other entities may have or obtain patents or proprietary rights that could limit our ability to make, use, sell, offer for sale or import vonoprazan and any future product candidates and products that may be approved in the future, or impair our competitive position. There is a substantial amount of litigation, both within and outside the United States, involving patent and other intellectual property rights in the biopharmaceutical industry, including patent infringement lawsuits, oppositions, reexaminations, IPR proceedings and PGR proceedings before the USPTO and/or foreign patent offices. Numerous third-party U.S. and foreign issued patents and pending patent applications exist in the fields in which we are developing product candidates. There may be third-party patents or patent applications with claims to materials, formulations, methods of manufacture or methods for treatment related to the use or manufacture of vonoprazan and any future product candidates.

As the biopharmaceutical industry expands and more patents are issued, the risk increases that vonoprazan and any future product candidates may be subject to claims of infringement of the patent rights of third parties. Because patent applications are maintained as confidential for a certain period of time, until the relevant application is published we may be unaware of third-party patents that may be infringed by commercialization of vonoprazan and any future product candidates, and we cannot be certain that we were the first to file a patent application related to a product candidate or technology. Moreover, because patent applications can take many years to issue, there may be currently-pending patent applications that may later result in issued patents that vonoprazan and any future product candidates may infringe. In addition, identification of third-party patent rights that may be relevant to our technology is difficult because patent searching is imperfect due to differences in terminology among patents, incomplete databases and the difficulty in assessing the meaning of patent claims. In addition, third parties may obtain patents in the future and claim that use of our technologies infringes upon these patents. Any claims of patent infringement asserted by third parties would be time consuming and could:

- result in costly litigation that may cause negative publicity;

- divert the time and attention of our technical personnel and management;
- cause development delays;
- prevent us from commercializing vonoprazan and any future product candidates until the asserted patent expires or is held finally invalid or not infringed in a court of law;
- require us to develop non-infringing technology, which may not be possible on a cost-effective basis;
- subject us to significant liability to third parties; or
- require us to enter into royalty or licensing agreements, which may not be available on commercially reasonable terms, or at all, or which might be non-exclusive, which could result in our competitors gaining access to the same technology.

Although no third party has asserted a claim of patent infringement against us as of the date of this prospectus, others may hold proprietary rights that could prevent vonoprazan and any future product candidates from being marketed.

Any patent-related legal action against us claiming damages and seeking to enjoin activities relating to vonoprazan and any future product candidates or processes could subject us to potential liability for damages, including treble damages if we were determined to willfully infringe, and require us to obtain a license to manufacture or develop vonoprazan and any future product candidates. Defense of these claims, regardless of their merit, would involve substantial litigation expense and would be a substantial diversion of employee resources from our business. We cannot predict whether we would prevail in any such actions or that any license required under any of these patents would be made available on commercially acceptable terms, if at all. Moreover, even if we or our future strategic partners were able to obtain a license, the rights may be nonexclusive, which could result in our competitors gaining access to the same intellectual property. In addition, we cannot be certain that we could redesign vonoprazan and any future product candidates or processes to avoid infringement, if necessary. Accordingly, an adverse determination in a judicial or administrative proceeding, or the failure to obtain necessary licenses, could prevent us from developing and commercializing vonoprazan and any future product candidates, which could harm our business, financial condition and operating results.

Parties making claims against us may be able to sustain the costs of complex patent litigation more effectively than we can because they have substantially greater resources. Furthermore, because of the substantial amount of discovery required in connection with intellectual property litigation or administrative proceedings, there is a risk that some of our confidential information could be compromised by disclosure. In addition, any uncertainties resulting from the initiation and continuation of any litigation could have a material adverse effect on our ability to raise additional funds or otherwise have a material adverse effect on our business, results of operations, financial condition and prospects.

***We may not be successful in obtaining or maintaining necessary rights to vonoprazan and any future product candidates through acquisitions and in-licenses.***

Because our development programs may in the future require the use of proprietary rights held by other third parties, the growth of our business may depend in part on our ability to acquire, in-license, or use these third-party proprietary rights. We may be unable to acquire or in-license any compositions, methods of use, processes or other third-party intellectual property rights from third parties that we identify as necessary for vonoprazan and any future product candidates. The licensing and acquisition of third-party intellectual property rights is a competitive area, and a number of more established

companies are also pursuing strategies to license or acquire third-party intellectual property rights that we may consider attractive. These established companies may have a competitive advantage over us due to their size, cash resources and greater clinical development and commercialization capabilities. In addition, companies that perceive us to be a competitor may be unwilling to assign or license rights to us. We also may be unable to license or acquire third-party intellectual property rights on terms that would allow us to make an appropriate return on our investment. If we are unable to successfully obtain rights to required third-party intellectual property rights or maintain the existing intellectual property rights we have, we may have to abandon development of that program and our business and financial condition could suffer.

***We may be involved in lawsuits to protect or enforce our future patents or the patents of our current and future licensors, which could be expensive, time consuming and unsuccessful. Further, our future issued patents or the patents of our current and future licensors could be found invalid or unenforceable if challenged in court.***

Competitors may infringe our intellectual property rights or those of our current and future licensors. To prevent infringement or unauthorized use, we and/or any such licensors may be required to file infringement claims, which can be expensive and time consuming. In addition, in a patent infringement proceeding, a court may decide that a patent we own or license is not valid, is unenforceable and/or is not infringed. If we or any of our current and future licensors were to initiate legal proceedings against a third party to enforce a patent directed at vonoprazan and any future product candidates, the defendant could counterclaim that our patent or the patent of our current or future licensor is invalid and/or unenforceable in whole or in part. In patent litigation, defendant counterclaims alleging invalidity and/or unenforceability are commonplace. Grounds for a validity challenge include an alleged failure to meet any of several statutory requirements, including lack of novelty, obviousness, written description, non-enablement, or obviousness-type double patenting. Grounds for an unenforceability assertion could include an allegation that someone connected with prosecution of the patent withheld relevant information from the USPTO or made a misleading statement during prosecution.

If a defendant were to prevail on a legal assertion of invalidity and/or unenforceability, we would lose at least part, and perhaps all, of the patent protection on such product candidate. In addition, if the breadth or strength of protection provided by our future patents and future patent applications or those of our current and future licensors is threatened, it could dissuade companies from collaborating with us to license, develop or commercialize current or future product candidates. Such a loss of patent protection would have a material adverse impact on our business.

Even if resolved in our favor, litigation or other legal proceedings relating to our intellectual property rights may cause us to incur significant expenses, and could distract our technical and management personnel from their normal responsibilities. Such litigation or proceedings could substantially increase our operating losses and reduce the resources available for development activities or any future sales, marketing or distribution activities. We may not have sufficient financial or other resources to conduct such litigation or proceedings adequately. Some of our competitors may be able to sustain the costs of such litigation or proceedings more effectively than we can because of their greater financial resources. Uncertainties resulting from the initiation and continuation of patent litigation or other proceedings could compromise our ability to compete in the marketplace.

Furthermore, because of the substantial amount of discovery required in connection with intellectual property litigation or other legal proceedings relating to our intellectual property rights, there is a risk that some of our confidential information could be compromised by disclosure during this type of litigation or other proceedings.

***Intellectual property litigation may lead to unfavorable publicity that harms our reputation and causes the market price of our common shares to decline.***

During the course of any intellectual property litigation, there could be public announcements of the initiation of the litigation as well as results of hearings, rulings on motions, and other interim proceedings in the litigation. If securities analysts or investors regard these announcements as negative, the perceived value of our existing products, programs or intellectual property could be diminished. Accordingly, the market price of shares of our common stock may decline. Such announcements could also harm our reputation or the market for our future products, which could have a material adverse effect on our business.

***Derivation or interference proceedings may be necessary to determine priority of inventions, and an unfavorable outcome may require us to cease using the related technology or to attempt to license rights from the prevailing party.***

Derivation or interference proceedings provoked by third parties or brought by us or declared by the USPTO or similar proceedings in foreign patent offices may be necessary to determine the priority of inventions with respect to our future patents or future patent applications or those of our current and future licensors. An unfavorable outcome could require us to cease using the related technology or to attempt to license rights to it from the prevailing party. Our business could be harmed if the prevailing party does not offer us a license on commercially reasonable terms. Our defense of such proceedings may fail and, even if successful, may result in substantial costs and distract our management and other employees. In addition, the uncertainties associated with such proceedings could have a material adverse effect on our ability to raise the funds necessary to continue our clinical trials, continue our research programs, license necessary technology from third parties or enter into development or manufacturing partnerships that would help us bring vonoprazan and any future product candidates to market.

***Recent patent reform legislation could increase the uncertainties and costs surrounding the prosecution of our future patent applications or those of our current and future licensors and the enforcement or defense of our future issued patents or those of our current and future licensors.***

On September 16, 2011, the Leahy-Smith America Invents Act, or Leahy-Smith Act, was signed into law. The Leahy-Smith Act includes a number of significant changes to U.S. patent law. These include provisions that affect the way patent applications will be prosecuted and may also affect patent litigation. In particular, under the Leahy-Smith Act, the United States transitioned in March 2013 to a “first inventor to file” system in which, assuming that other requirements of patentability are met, the first inventor to file a patent application will be entitled to the patent regardless of whether a third party was first to invent the claimed invention. A third party that files a patent application in the USPTO after March 2013 but before us could therefore be awarded a patent covering an invention of ours even if we had made the invention before it was made by such third party. This will require us to be cognizant going forward of the time from invention to filing of a patent application. Furthermore, our ability to obtain and maintain valid and enforceable patents depends on whether the differences between our technology and the prior art allow our technology to be patentable over the prior art. Since patent applications in the United States and most other countries are confidential for a period of time after filing or until issuance, we may not be certain that we or our current and future licensors are the first to either (1) file any patent application related to vonoprazan and any future product candidates or (2) invent any of the inventions claimed in the patents or patent applications.

The Leahy-Smith Act also includes a number of significant changes that affect the way patent applications will be prosecuted and also may affect patent litigation. These include allowing third-party

submission of prior art to the USPTO during patent prosecution and additional procedures to attack the validity of a patent by USPTO administered post-grant proceedings, including PGR, IPR, and derivation proceedings. An adverse determination in any such submission or proceeding could reduce the scope or enforceability of, or invalidate, our patent rights, which could adversely affect our competitive position.

Because of a lower evidentiary standard in USPTO proceedings compared to the evidentiary standard in United States federal courts necessary to invalidate a patent claim, a third party could potentially provide evidence in a USPTO proceeding sufficient for the USPTO to hold a claim invalid even though the same evidence would be insufficient to invalidate the claim if first presented in a district court action. Accordingly, a third party may attempt to use the USPTO procedures to invalidate our patent claims that would not have been invalidated if first challenged by the third party as a defendant in a district court action. Thus, the Leahy-Smith Act and its implementation could increase the uncertainties and costs surrounding the prosecution of our future patent applications or those of our current and future licensors and the enforcement or defense of our future issued patents or those of our current and future licensors, all of which could have a material adverse effect on our business, financial condition, results of operations and prospects.

***Changes in U.S. patent law, or laws in other countries, could diminish the value of patents in general, thereby impairing our ability to protect vonoprazan and any future product candidates.***

As is the case with other biopharmaceutical companies, our success is heavily dependent on intellectual property, particularly patents. Obtaining and enforcing patents in the biopharmaceutical industry involve a high degree of technological and legal complexity. Therefore, obtaining and enforcing biopharmaceutical patents is costly, time consuming and inherently uncertain. Changes in either the patent laws or in the interpretations of patent laws in the United States and other countries may diminish the value of our intellectual property and may increase the uncertainties and costs surrounding the prosecution of patent applications and the enforcement or defense of issued patents. We cannot predict the breadth of claims that may be allowed or enforced in our future patents or in third-party patents. In addition, Congress or other foreign legislative bodies may pass patent reform legislation that is unfavorable to us. For example, a new bill (Terminating the Extension of Rights Misappropriated Act H.R. 3199) percolating through the United States Congress aims to reduce the term of certain drug patents in order to ease generic entry and increase competition. Evolving judicial interpretation of patent law could also adversely affect our business. For example, the U.S. Supreme Court has ruled on several patent cases in recent years, either narrowing the scope of patent protection available in certain circumstances or weakening the rights of patent owners in certain situations. In addition to increasing uncertainty with regard to our ability to obtain patents in the future, this combination of events has created uncertainty with respect to the value of patents, once obtained. Depending on decisions by the U.S. Congress, the U.S. federal courts, the USPTO, or similar authorities in foreign jurisdictions, the laws and regulations governing patents could change in unpredictable ways that would weaken our ability to obtain new patents or to enforce the existing licensed patents and the patents we might obtain or license in the future.

***We may be subject to claims challenging the inventorship or ownership of our future patents, the patents of our current and future licensors, or other intellectual property.***

We may also be subject to claims that former employees or other third parties have an ownership interest in our future patents, the patents of our current and future licensors or other intellectual property. Litigation may be necessary to defend against these and other claims challenging inventorship or ownership. If we fail in defending any such claims, in addition to paying monetary damages, we may lose valuable intellectual property rights. Such an outcome could have a material adverse effect on our business. Even if we are successful in defending against such claims, litigation could result in substantial costs and distraction to management and other employees.

***Patent terms may be inadequate to protect our competitive position on vonoprazan and any future product candidates for an adequate amount of time.***

Patents have a limited lifespan. In the United States, if all maintenance fees are timely paid, the natural expiration of a patent is generally 20 years from its earliest U.S. non-provisional filing date. Various extensions may be available, but the life of a patent, and the protection it affords, is limited. Even if patents covering vonoprazan and any future product candidates are obtained, once the patent life has expired, we may be open to competition from competitive products. Given the amount of time required for the development, testing and regulatory review of product candidates, patents protecting vonoprazan and any future product candidates might expire before or shortly after such candidates are commercialized. As a result, our patent portfolio may not provide us with sufficient rights to exclude others from commercializing products similar or identical to ours.

***If we do not obtain patent term extension for vonoprazan and any future product candidates, our business may be materially harmed.***

Depending upon the timing, duration and specifics of FDA marketing approval of vonoprazan and any future product candidates, one or more of our U.S. patents or those of our current and future licensors, may be eligible for limited patent term restoration under the Drug Price Competition and Patent Term Restoration Act of 1984, or the Hatch-Waxman Amendments. The Hatch- Waxman Amendments permit a patent restoration term of up to five years as compensation for patent term lost during product development and the FDA regulatory review process. A maximum of one patent may be extended per FDA approved product as compensation for the patent term lost during the FDA regulatory review process. A patent term extension cannot extend the remaining term of a patent beyond a total of 14 years from the date of product approval and only those claims covering such approved drug product, a method for using it or a method for manufacturing it may be extended. Patent term extension may also be available in certain foreign countries upon regulatory approval of vonoprazan and any future product candidates. However, we may not be granted an extension because of, for example, failing to apply within applicable deadlines, failing to apply prior to expiration of relevant patents or otherwise failing to satisfy applicable requirements. Moreover, the applicable time period or the scope of patent protection afforded could be less than we request. If we are unable to obtain patent term extension or restoration or the term of any such extension is less than we request, our competitors may obtain approval of competing products following our patent expiration, and our revenue could be reduced, possibly materially. Further, if this occurs, our competitors may take advantage of our investment in development and trials by referencing our clinical and preclinical data and launch their product earlier than might otherwise be the case.

***We may not be able to protect our intellectual property rights throughout our licensed territories.***

Although we have issued patents and pending patent applications in the United States and certain other countries in which we intend to commercialize our products, filing, prosecuting and defending patents in all relevant countries throughout the could be prohibitively expensive, and our intellectual property rights in some countries outside the United States can be less extensive than those in the United States. In addition, the laws of some foreign countries do not protect intellectual property rights to the same extent as federal and state laws in the United States. Consequently, we may not be able to prevent third parties from practicing our inventions in all countries outside the United States or from selling or importing products made using our inventions in and into the United States or other jurisdictions. Competitors may use our technologies in jurisdictions where we have not obtained patent protection to develop their own products and, further, may export otherwise infringing products to territories where we have patent protection but enforcement is not as strong as that in the United States. These products may compete with vonoprazan or any future product candidates, and

our patents, the patents of our current and future licensors or other intellectual property rights may not be effective or sufficient to prevent them from competing.

Many companies have encountered significant problems in protecting and defending intellectual property rights in foreign jurisdictions. The legal systems of many foreign countries do not favor the enforcement of patents and other intellectual property protection, which could make it difficult for us to stop the infringement of our intellectual property rights or marketing of competing products in violation of our proprietary rights. Proceedings to enforce our patent rights in foreign jurisdictions could result in substantial costs and divert our efforts and attention from other aspects of our business, could put our future patents or the patents of our current and future licensors at risk of being invalidated or interpreted narrowly and our future patent applications or the patent applications of our current and future licensors at risk of not issuing and could provoke third parties to assert claims against us. We may not prevail in any lawsuits that we initiate, and the damages or other remedies awarded, if any, may not be commercially meaningful. Accordingly, our efforts to enforce our intellectual property rights around the world may be inadequate to obtain a significant commercial advantage from the intellectual property that we develop or license.

Many countries have compulsory licensing laws under which a patent owner may be compelled to grant licenses to third parties. In addition, many countries limit the enforceability of patents against government agencies or government contractors. In these countries, the patent owner may have limited remedies, which could materially diminish the value of such patent. If we are forced to grant a license to third parties with respect to any patents relevant to our business, our competitive position may be impaired, and our business, financial condition, results of operations and prospects may be adversely affected.

***Obtaining and maintaining our patent protection depends on compliance with various procedural, documentary, fee payment and other requirements imposed by regulations and governmental patent agencies, and our patent protection could be reduced or eliminated for non-compliance with these requirements.***

Periodic maintenance fees, renewal fees, annuity fees and various other governmental fees on patents and/or applications will be due to the USPTO and various foreign patent offices at various points over the lifetime of our future patents and/or future applications and those of our current and future licensors. We have systems in place to remind us to pay these fees, and we rely on third parties to pay these fees when due. Additionally, the USPTO and various foreign patent offices require compliance with a number of procedural, documentary, fee payment and other similar provisions during the patent application process. We employ reputable law firms and other professionals to help us comply, and in many cases, an inadvertent lapse can be cured by payment of a late fee or by other means in accordance with rules applicable to the particular jurisdiction. However, there are situations in which noncompliance can result in abandonment or lapse of the patent or patent application, resulting in partial or complete loss of patent rights in the relevant jurisdiction. If such an event were to occur, it could have a material adverse effect on our business.

***If we are unable to protect the confidentiality of our trade secrets, our business and competitive position would be harmed.***

In addition, we rely on the protection of our trade secrets, including unpatented know-how, technology and other proprietary information to maintain our competitive position. Although we have taken steps to protect our trade secrets and unpatented know-how, including entering into confidentiality agreements with third parties, and confidential information and inventions agreements with employees, consultants and advisors, we cannot provide any assurances that all such agreements have been duly executed, and any of these parties may breach the agreements and disclose our

proprietary information, including our trade secrets, and we may not be able to obtain adequate remedies for such breaches. Enforcing a claim that a party illegally disclosed or misappropriated a trade secret is difficult, expensive and time consuming, and the outcome is unpredictable. In addition, some courts inside and outside the United States are less willing or unwilling to protect trade secrets.

Moreover, third parties may still obtain this information or may come upon this or similar information independently, and we would have no right to prevent them from using that technology or information to compete with us. If any of these events occurs or if we otherwise lose protection for our trade secrets, the value of this information may be greatly reduced and our competitive position would be harmed. If we cannot otherwise maintain the confidentiality of our proprietary technology and other confidential information, then our ability to protect our trade secret information may be jeopardized.

***We may be subject to claims that we have wrongfully hired an employee from a competitor or that we or our employees have wrongfully used or disclosed alleged confidential information or trade secrets of their former employers.***

As is common in the biopharmaceutical industry, in addition to our employees, we engage the services of consultants to assist us in the development of vonoprazan and any future product candidates. Many of these consultants, and many of our employees, were previously employed at, or may have previously provided or may be currently providing consulting services to, other biopharmaceutical companies including our competitors or potential competitors. We may become subject to claims that we, our employees or a consultant inadvertently or otherwise used or disclosed trade secrets or other information proprietary to their former employers or their former or current clients. Litigation may be necessary to defend against these claims. If we fail in defending any such claims, in addition to paying monetary damages, we may lose valuable intellectual property rights or personnel, which could adversely affect our business. Even if we are successful in defending against these claims, litigation could result in substantial costs and be a distraction to our management team and other employees.

***If our trademarks and trade names are not adequately protected, then we may not be able to build name recognition in our markets of interest and our business may be adversely affected.***

We intend to use registered or unregistered trademarks or trade names to brand and market ourselves and our products. Our trademarks or trade names may be challenged, infringed, circumvented or declared generic or determined to be infringing on other marks. We may not be able to protect our rights to these trademarks and trade names, which we need to build name recognition among potential partners or customers in our markets of interest. At times, competitors may adopt trade names or trademarks similar to ours, thereby impeding our ability to build brand identity and possibly leading to market confusion. In addition, there could be potential trade name or trademark infringement claims brought by owners of other trademarks or trademarks that incorporate variations of our registered or unregistered trademarks or trade names. Over the long term, if we are unable to establish name recognition based on our trademarks and trade names, then we may not be able to compete effectively and our business may be adversely affected. We may license our trademarks and trade names to third parties, such as distributors. Though these license agreements may provide guidelines for how our trademarks and trade names may be used, a breach of these agreements or misuse of our trademarks and tradenames by our licensees may jeopardize our rights in or diminish the goodwill associated with our trademarks and trade names. Our efforts to enforce or protect our proprietary rights related to trademarks, trade names, trade secrets, domain names, copyrights or other intellectual property may be ineffective and could result in substantial costs and diversion of resources and could adversely affect our financial condition or results of operations.

***Any collaboration arrangements that we have or may enter into in the future may not be successful, which could adversely affect our ability to develop and commercialize our products.***

The success of our collaboration arrangements will depend heavily on the efforts and activities of our collaborators and partners. Under the Takeda License, for example, Takeda has certain obligations with respect to assisting with the transition of information and materials to us as well as providing clinical and commercial supply of the vonoprazan product. Collaborations and partnerships are subject to numerous risks, which may include that:

- collaborators have significant discretion in determining the efforts and resources that they will apply to collaborations;
- collaborators may not pursue development and commercialization of our products or may elect not to continue or renew development or commercialization programs based on trial or test results, changes in their strategic focus due to the acquisition of competitive products, availability of funding or other external factors, such as a business combination that diverts resources or creates competing priorities;
- collaborators could independently develop, or develop with third parties, products that compete directly or indirectly with our products or product candidates;
- a collaborator with marketing, manufacturing and distribution rights to one or more products may not commit sufficient resources to or otherwise not perform satisfactorily in carrying out these activities;
- we could grant exclusive rights to our collaborators that would prevent us from collaborating with others;
- collaborators may not properly maintain or defend our intellectual property rights or may use our intellectual property or proprietary information in a way that gives rise to actual or threatened litigation that could jeopardize or invalidate our intellectual property or proprietary information or expose us to potential liability;
- disputes may arise between us and a collaborator that causes the delay or termination of the research, development or commercialization of our current or future products or that results in costly litigation or arbitration that diverts management attention and resources;
- collaborations may be terminated, and, if terminated, may result in a need for additional capital to pursue further development or commercialization of the applicable current or future products;
- collaborators may own or co-own intellectual property covering our products that results from our collaborating with them, and in such cases, we would not have the exclusive right to develop or commercialize such intellectual property; and
- a collaborator’s sales and marketing activities or other operations may not be in compliance with applicable laws resulting in civil or criminal proceedings.

***Intellectual property discovered through government funded programs may be subject to federal regulations such as “march-in” rights, certain reporting requirements and a preference for U.S.-based companies. Compliance with such regulations may limit our exclusive rights, and limit our ability to contract with non-U.S. manufacturers.***

We may acquire or license in the future intellectual property rights that have been generated through the use of U.S. government funding or grant. Pursuant to the Bayh-Dole Act of 1980, the U.S. government has certain rights in inventions developed with government funding. These U.S. government rights include a non-exclusive, non-transferable, irrevocable worldwide license to use

inventions for any governmental purpose. In addition, the U.S. government has the right, under certain limited circumstances, to require us to grant exclusive, partially exclusive, or non-exclusive licenses to any of these inventions to a third party if it determines that: (i) adequate steps have not been taken to commercialize the invention; (ii) government action is necessary to meet public health or safety needs; or (iii) government action is necessary to meet requirements for public use under federal regulations (also referred to as "march-in rights"). The U.S. government also has the right to take title to these inventions if the grant recipient fails to disclose the invention to the government or fails to file an application to register the intellectual property within specified time limits. Intellectual property generated under a government funded program is also subject to certain reporting requirements, compliance with which may require us to expend substantial resources. In addition, the U.S. government requires that any products embodying any of these inventions or produced through the use of any of these inventions be manufactured substantially in the United States. This preference for U.S. industry may be waived by the federal agency that provided the funding if the owner or assignee of the intellectual property can show that reasonable but unsuccessful efforts have been made to grant licenses on similar terms to potential licensees that would be likely to manufacture substantially in the United States or that under the circumstances domestic manufacture is not commercially feasible. This preference for U.S. industry may limit our ability to contract with non-U.S. product manufacturers for products covered by such intellectual property.

### Risks Related to Our Common Stock and This Offering

***An active, liquid and orderly market for our common stock may not develop, and you may not be able to resell your common stock at or above the public offering price.***

Prior to this offering, there has been no public market for our common stock. Although we expect to list our common stock on Nasdaq, an active trading market for our common stock may never develop or be sustained following this offering. We and the representatives of the underwriters will determine the initial public offering price of our common stock through negotiation. This price will not necessarily reflect the price at which investors in the market will be willing to buy and sell our shares following this offering. In addition, an active trading market may not develop following the consummation of this offering or, if it is developed, may not be sustained. The lack of an active market may impair your ability to sell your shares at the time you wish to sell them or at a price that you consider reasonable. An inactive market may also impair our ability to raise capital by selling shares and may impair our ability to acquire other businesses or technologies using our shares as consideration, which, in turn, could materially adversely affect our business.

***The trading price of the shares of our common stock could be highly volatile, and purchasers of our common stock could incur substantial losses.***

Our stock price is likely to be volatile. The stock market in general and the market for stock of biopharmaceutical companies in particular have experienced extreme volatility that has often been unrelated to the operating performance of particular companies. As a result of this volatility, investors may not be able to sell their common stock at or above the initial public offering price. The market price for our common stock may be influenced by those factors discussed in this "Risk Factors" section and many others, including:

- our ability to enroll patients in our planned clinical trials;
- results of our clinical trials and preclinical studies, the results of clinical trials conducted by Takeda and others for vonoprazan, and the results of trials of our competitors or those of other companies in our market sector;
- regulatory approval of vonoprazan and any future product candidates, or limitations to specific label indications or patient populations for its use, or changes or delays in the regulatory review process;

- any termination or loss of rights under the Takeda License;
- regulatory developments in the United States and foreign countries;
- changes in the structure of healthcare payment systems, especially in light of current reforms to the U.S. healthcare system;
- the success or failure of our efforts to acquire, license or develop additional product candidates;
- innovations or new products developed by us or our competitors;
- announcements by us or our competitors of significant acquisitions, strategic partnerships, joint ventures or capital commitments;
- manufacturing, supply or distribution delays or shortages;
- any changes to our relationship with any manufacturers, suppliers, licensors, future collaborators or other strategic partners;
- achievement of expected product sales and profitability;
- variations in our financial results or those of companies that are perceived to be similar to us;
- market conditions in the biopharmaceutical sector and issuance of securities analysts' reports or recommendations;
- trading volume of our common stock;
- an inability to obtain additional funding;
- sales of our stock by insiders and stockholders, including Takeda;
- general economic, industry and market conditions other events or factors, many of which are beyond our control;
- additions or departures of key personnel;
- intellectual property, product liability or other litigation against us;
- changes in our capital structure, such as future issuances of securities and the incurrence of additional debt; and
- changes in accounting standards, policies, guidelines, interpretations or principles.

In addition, in the past, stockholders have initiated class action lawsuits against biopharmaceutical companies following periods of volatility in the market prices of these companies' stock. Such litigation, if instituted against us, could cause us to incur substantial costs and divert management's attention and resources, which could have a material adverse effect on our business, financial condition and results of operations.

***Our failure to meet the continued listing requirements of the Nasdaq could result in a delisting of our common stock.***

If, after listing, we fail to satisfy the continued listing requirements of the Nasdaq, such as the corporate governance requirements or the minimum closing bid price requirement, Nasdaq may take steps to delist our common stock. Such a delisting would likely have a negative effect on the price of our common stock and would impair your ability to sell or purchase our common stock when you wish to do so. In the event of a delisting, any action taken by us to restore compliance with listing requirements may not allow our common stock to become listed again, stabilize the market price or improve the liquidity of our common stock, prevent our common stock from dropping below the Nasdaq minimum bid price requirement or prevent future non-compliance with Nasdaq's listing requirements.

***We may allocate the net proceeds from this offering in ways that you and other stockholders may not approve.***

Our management will have broad discretion in the application of the net proceeds from this offering, including for any of the purposes described in the section titled "Use of Proceeds." Because of the number and variability of factors that will determine our use of the net proceeds from this offering, their ultimate use may vary substantially from their currently intended use. Our management might not apply our net proceeds in ways that ultimately increase the value of your investment, and the failure by our management to apply these funds effectively could harm our business. Pending their use, we may invest the net proceeds from this offering in short- and intermediate-term, investment grade interest-bearing instruments. These investments may not yield a favorable return to our stockholders. If we do not invest or apply the net proceeds from this offering in ways that enhance stockholder value, we may fail to achieve expected results, which could cause our stock price to decline.

***You will suffer immediate and substantial dilution in the net tangible book value of the common stock you purchase.***

The initial public offering price of our common stock is substantially higher than the pro forma as adjusted net tangible book value per share of our outstanding common stock immediately after the completion of this offering. Purchasers of common stock in this offering will experience immediate dilution of approximately $11.46 per share, assuming an initial public offering price of $19.00 per share, the midpoint of the price range set forth on the cover page of this prospectus.

***After this offering, our executive officers, directors and principal stockholders, if they choose to act together, will continue to have the ability to control or significantly influence all matters submitted to stockholders for approval. Furthermore, many of our current directors were appointed by our principal stockholders.***

Following the completion of this offering, our executive officers, directors and greater than 5% stockholders, in the aggregate, will own approximately 47.9% of our outstanding common stock (assuming no exercise of the underwriters' option to purchase additional shares and no exercise of outstanding options, warrants or other rights, and without giving effect to any purchases that these holders may make through our directed share program), assuming an initial public offering price of $19.00 per share, the midpoint of the price range set forth on the cover page of this prospectus. Furthermore, many of our current directors were appointed by our principal stockholders. As a result, such persons or their appointees to our board of directors, acting together, will have the ability to control or significantly influence all matters submitted to our board of directors or stockholders for approval, including the appointment of our management, the election and removal of directors and approval of any significant transaction, as well as our management and business affairs. In addition, if any of our executive officers, directors and greater than 5% stockholders purchase shares in this offering, or if any of our other current investors purchase shares in this offering and become greater than 5% stockholders as a result, the ability of such persons, acting together, to control or significantly influence such matters will increase. This concentration of ownership may have the effect of delaying, deferring or preventing a change in control, impeding a merger, consolidation, takeover or other business combination involving us, or discouraging a potential acquiror from making a tender offer or otherwise attempting to obtain control of our business, even if such a transaction would benefit other stockholders.

***We do not currently intend to pay dividends on our common stock, and, consequently, your ability to achieve a return on your investment will depend on appreciation, if any, in the price of our common stock.***

We have never declared or paid any cash dividend on our common stock. We currently anticipate that we will retain future earnings for the development, operation and expansion of our business and

do not anticipate declaring or paying any cash dividends for the foreseeable future. In addition, under the terms of the Loan Agreement, we are prohibited from paying any cash dividends without the consent of the lenders. Any return to stockholders will therefore be limited to the appreciation of their stock. Shares of our common stock may not appreciate in value or even maintain the price at which stockholders have purchased their shares.

***Sales of a substantial number of shares of our common stock by our existing stockholders, including Takeda, in the public market could cause our stock price to fall.***

Sales of a substantial number of shares of our common stock in the public market or the perception that these sales might occur could significantly reduce the market price of our common stock and impair our ability to raise adequate capital through the sale of additional equity securities.

Based on shares of common stock outstanding as of June 30, 2019, upon the closing of this offering, we will have outstanding a total of 25,883,458 shares of common stock after this offering, assuming no exercise of the underwriters' option to purchase additional shares and no exercise of outstanding options, warrants or other rights. Of these shares, only the 7,900,000 shares of common stock sold in this offering by us, plus any shares sold upon exercise of the underwriters' option to purchase additional shares, will be freely tradable, without restriction, in the public market immediately following this offering, unless they are purchased by one of our affiliates.

In addition, immediately following the completion of this offering, Takeda will beneficially own 25.9% of our outstanding shares of common stock, including 7,588,000 shares of common stock issuable pursuant to the Takeda Warrant (or 25.0% if the underwriters exercise their option to purchase additional shares in full). The sale by Takeda of a substantial number of shares after this offering, or a perception that such sales could occur, could significantly reduce the market price of our common stock.

Our officers, directors and holders of substantially all of our outstanding securities have entered into lock-up agreements with the underwriters pursuant to which they may not, with limited exceptions, for a period of 180 days from the date of this prospectus, offer, sell or otherwise transfer or dispose of any of our securities, without the prior written consent of Goldman Sachs & Co. LLC, Jefferies LLC and Evercore Group L.L.C. The underwriters may permit our officers, directors and other securityholders who are subject to the lock-up agreements to sell shares prior to the expiration of the lock-up agreements, subject to limitations. Sales of these shares, or perceptions that they will be sold, could cause the trading price of our common stock to decline. After the lock-up agreements expire, up to an additional 17,983,458 shares of common stock will be eligible for sale in the public market of which 12,399,381 shares are held by directors, executive officers and other affiliates and will be subject to volume limitations under Rule 144 under the Securities Act.

In addition, as of June 30, 2019, up to 9,819,925 shares of common stock that are either subject to outstanding options, warrants or other rights or reserved for future issuance under our employee benefit plans will become eligible for sale in the public market to the extent permitted by the provisions of various vesting schedules, exercise limitations, the lock-up agreements and Rule 144 and Rule 701 under the Securities Act. If these additional shares of common stock are sold, or if it is perceived that they will be sold, in the public market, the trading price of our common stock could decline.

After this offering, the holders of 12,068,938 shares of our outstanding common stock, or approximately 46.6% of our total outstanding common stock as of June 30, 2019, will be entitled to rights with respect to the registration of their shares under the Securities Act, subject to vesting and the 180-day lock-up agreements described above. In addition, upon the closing of this offering Takeda will be entitled to the same rights with respect to the registration of 7,588,000 shares of our common stock

underlying the Takeda Warrant. Registration of these shares under the Securities Act would result in the shares becoming freely tradable without restriction under the Securities Act, except for shares held by affiliates, as defined in Rule 144 under the Securities Act. Any sales of securities by these stockholders could have a material adverse effect on the trading price of our common stock.

***We are an emerging growth company and a smaller reporting company, and the reduced disclosure requirements applicable to emerging growth companies and smaller reporting company may make our common stock less attractive to investors.***

We are an emerging growth company, as defined in the JOBS Act, and may remain an emerging growth company until the last day of the fiscal year following the fifth anniversary of the completion of this offering. However, if certain events occur prior to the end of such five-year period, including if we become a "large accelerated filer" as defined in Rule 12b-2 under the Exchange Act, our annual gross revenues exceed $1.07 billion or we issue more than $1.0 billion of non-convertible debt in any three-year period, we will cease to be an emerging growth company prior to the end of such five-year period. For so long as we remain an emerging growth company, we are permitted and intend to rely on exemptions from certain disclosure requirements that are applicable to other public companies that are not emerging growth companies. These exemptions include:

- being permitted to provide only two years of audited financial statements, in addition to any required unaudited interim financial statements, with correspondingly reduced "Management's Discussion and Analysis of Financial Condition and Results of Operations" disclosure;
- not being required to comply with the auditor attestation requirements in the assessment of our internal control over financial reporting pursuant to the Sarbanes-Oxley Act;
- not being required to comply with any requirement that may be adopted by the Public Company Accounting Oversight Board regarding mandatory audit firm rotation or a supplement to the auditor's report providing additional information about the audit and the financial statements, unless the SEC, determines the new rules are necessary for protecting the public;
- reduced disclosure obligations regarding executive compensation; and
- exemptions from the requirements of holding a nonbinding advisory vote on executive compensation and shareholder approval of any golden parachute payments not previously approved.

We have taken advantage of reduced reporting burdens in this prospectus. In particular, we have not included all of the executive compensation related information that would be required if we were not an emerging growth company. Investors may find our common stock less attractive if we rely on these exemptions. If some investors find our common stock less attractive as a result, there may be a less active trading market for our common stock and our stock price may be reduced or more volatile. In addition, the JOBS Act provides that an emerging growth company can take advantage of an extended transition period for complying with new or revised accounting standards. This allows an emerging growth company to delay the adoption of these accounting standards until they would otherwise apply to private companies. We have irrevocably elected not to avail ourselves of this exemption and, therefore, we will be subject to the same new or revised accounting standards as other public companies that are not emerging growth companies.

We are also a smaller reporting company as defined in the Exchange Act. We may continue to be a smaller reporting company even after we are no longer an emerging growth company. We may take advantage of certain of the scaled disclosures available to smaller reporting companies and will be able to take advantage of these scaled disclosures for so long as our voting and non-voting common stock held by non-affiliates is less than $250.0 million measured on the last business day of our second fiscal quarter, or our annual revenue is less than $100.0 million during the most recently completed

fiscal year and our voting and non-voting common stock held by non-affiliates is less than $700.0 million measured on the last business day of our second fiscal quarter.

***We will incur significant increased costs as a result of operating as a public company, and our management will be required to devote substantial time to new compliance initiatives.***

As a public company, we will incur significant legal, accounting and other expenses that we did not incur as a private company. We will be subject to the reporting requirements of the Exchange Act, which will require, among other things, that we file with the SEC, annual, quarterly and current reports with respect to our business and financial condition. In addition, the Sarbanes-Oxley Act, as well as rules subsequently adopted by the SEC and Nasdaq to implement provisions of the Sarbanes-Oxley Act, impose significant requirements on public companies, including requiring establishment and maintenance of effective disclosure and financial controls and changes in corporate governance practices. Further, pursuant to the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010, the SEC has adopted additional rules and regulations in these areas, such as mandatory “say on pay” voting requirements that will apply to us when we cease to be an emerging growth company. Stockholder activism, the current political environment and the current high level of government intervention and regulatory reform may lead to substantial new regulations and disclosure obligations, which may lead to additional compliance costs and impact the manner in which we operate our business in ways we cannot currently anticipate.

We expect the rules and regulations applicable to public companies to substantially increase our legal and financial compliance costs and to make some activities more time consuming and costly. If these requirements divert the attention of our management and personnel from other business concerns, they could have a material adverse effect on our business, financial condition and results of operations. The increased costs will decrease our net income or increase our net loss, and may require us to reduce costs in other areas of our business or increase the prices of our products or services. For example, we expect these rules and regulations to make it more difficult and more expensive for us to obtain director and officer liability insurance, and we may be required to incur substantial costs to maintain the same or similar coverage. We cannot predict or estimate the amount or timing of additional costs we may incur to respond to these requirements. The impact of these requirements could also make it more difficult for us to attract and retain qualified persons to serve on our board of directors, our board committees or as executive officers.

***If securities or industry analysts do not publish research or reports or publish unfavorable research or reports about our business, our stock price and trading volume could decline.***

The trading market for our common stock will depend in part on the research and reports that securities or industry analysts publish about us, our business, our market or our competitors. We do not currently have and may never obtain research coverage by securities and industry analysts. If no securities or industry analysts commence coverage of our company, the trading price for our stock would be negatively impacted. In the event we obtain securities or industry analyst coverage, if one or more of the analysts who covers us downgrades our stock, our stock price would likely decline. If one or more of these analysts ceases to cover us or fails to regularly publish reports on us, interest in our stock could decrease, which could cause our stock price or trading volume to decline.

***If we fail to maintain proper and effective internal control over financial reporting, our ability to produce accurate and timely financial statements could be impaired, investors may lose confidence in our financial reporting and the trading price of our common stock may decline.***

Pursuant to Section 404 of Sarbanes-Oxley, our management will be required to report upon the effectiveness of our internal control over financial reporting beginning with our second annual report after this offering. When we lose our status as an “emerging growth company” and reach an

accelerated filer threshold, our independent registered public accounting firm will be required to attest to the effectiveness of our internal control over financial reporting. The rules governing the standards that must be met for management to assess our internal control over financial reporting are complex and require significant documentation, testing and possible remediation. To comply with the requirements of being a reporting company under the Exchange Act, we will need to upgrade our information technology systems; implement additional financial and management controls, reporting systems and procedures; and hire additional accounting and finance staff. If we or, if required, our auditors are unable to conclude that our internal control over financial reporting is effective, investors may lose confidence in our financial reporting and the trading price of our common stock may decline.

There could be material weaknesses or significant deficiencies in our internal control over financial reporting in the future. Any failure to maintain internal control over financial reporting could severely inhibit our ability to accurately report our financial condition, results of operations or cash flows. If we are unable to conclude that our internal control over financial reporting is effective, or if our independent registered public accounting firm determines we have a material weakness or significant deficiency in our internal control over financial reporting once that firm begin its Section 404 reviews, investors may lose confidence in the accuracy and completeness of our financial reports, the market price of our common stock could decline, and we could be subject to sanctions or investigations by Nasdaq, the SEC or other regulatory authorities. Failure to remedy any material weakness in our internal control over financial reporting, or to implement or maintain other effective control systems required of public companies, could also restrict our future access to the capital markets.

***Provisions in our charter documents and under Delaware law could discourage a takeover that stockholders may consider favorable and may lead to entrenchment of management.***

Our amended and restated certificate of incorporation and amended and restated bylaws that will be in effect immediately prior to the consummation of this offering will contain provisions that could significantly reduce the value of our shares to a potential acquiror or delay or prevent changes in control or changes in our management without the consent of our board of directors. The provisions in our charter documents will include the following:

- a classified board of directors with three-year staggered terms, which may delay the ability of stockholders to change the membership of a majority of our board of directors;
- no cumulative voting in the election of directors, which limits the ability of minority stockholders to elect director candidates;
- the exclusive right of our board of directors, unless the board of directors grants such right to the stockholders, to elect a director to fill a vacancy created by the expansion of the board of directors or the resignation, death or removal of a director, which prevents stockholders from being able to fill vacancies on our board of directors;
- the required approval of at least 66-2/3% of the shares entitled to vote to remove a director for cause, and the prohibition on removal of directors without cause;
- the ability of our board of directors to authorize the issuance of shares of preferred stock and to determine the price and other terms of those shares, including preferences and voting rights, without stockholder approval, which could be used to significantly dilute the ownership of a hostile acquiror;
- the ability of our board of directors to alter our amended and restated bylaws without obtaining stockholder approval;
- the required approval of at least 66-2/3% of the shares entitled to vote to adopt, amend or repeal our amended and restated bylaws or repeal the provisions of our amended and restated certificate of incorporation regarding the election and removal of directors;

- a prohibition on stockholder action by written consent, which forces stockholder action to be taken at an annual or special meeting of our stockholders;
- an exclusive forum provision providing that the Court of Chancery of the State of Delaware will be the exclusive forum for certain actions and proceedings;
- the requirement that a special meeting of stockholders may be called only by the board of directors, which may delay the ability of our stockholders to force consideration of a proposal or to take action, including the removal of directors; and
- advance notice procedures that stockholders must comply with in order to nominate candidates to our board of directors or to propose matters to be acted upon at a stockholders' meeting, which may discourage or deter a potential acquiror from conducting a solicitation of proxies to elect the acquiror's own slate of directors or otherwise attempting to obtain control of us.

We are also subject to the anti-takeover provisions contained in Section 203 of the Delaware General Corporation Law. Under Section 203, a corporation may not, in general, engage in a business combination with any holder of 15% or more of its capital stock unless the holder has held the stock for three years or, among other exceptions, the board of directors has approved the transaction.

***Our amended and restated certificate of incorporation and amended and restated bylaws will provide that the Court of Chancery of the State of Delaware will be the exclusive forum for substantially all disputes between us and our stockholders, which could limit our stockholders' ability to obtain a favorable judicial forum for disputes with us or our directors, officers or employees.***

Our amended and restated certificate of incorporation and amended and restated bylaws will provide that the Court of Chancery of the State of Delaware is the exclusive forum for any derivative action or proceeding brought on our behalf under Delaware statutory or common law, including any action asserting a breach of fiduciary duty, any action asserting a claim against us arising pursuant to the Delaware General Corporation Law, our amended and restated certificate of incorporation or our amended and restated bylaws, or any action asserting a claim against us that is governed by the internal affairs doctrine; provided, that, this provision would not apply to suits brought to enforce a duty or liability created by the Securities Act or the Exchange Act, or any other claim for which the federal courts have exclusive jurisdiction. To the extent that any such claims may be based upon federal law claims, Section 27 of the Exchange Act creates exclusive federal jurisdiction over all suits brought to enforce any duty or liability created by the Exchange Act or the rules and regulations thereunder. The choice of forum provisions in our amended and restated certificate of incorporation may limit a stockholder's ability to bring a claim in a judicial forum that it finds favorable for disputes with us or our directors, officers or other employees, which may discourage such lawsuits against us and our directors, officers and other employees. By agreeing to these provisions, however, stockholders will not be deemed to have waived our compliance with the federal securities laws and the rules and regulations thereunder. Furthermore, the enforceability of similar choice of forum provisions in other companies' certificates of incorporation has been challenged in legal proceedings, and it is possible that a court could find these types of provisions to be inapplicable or unenforceable. If a court were to find the choice of forum provisions in our amended and restated certificate of incorporation to be inapplicable or unenforceable in an action, we may incur additional costs associated with resolving such action in other jurisdictions, which could adversely affect our business and financial condition.

***Our ability to use net operating loss carryforwards and other tax attributes may be limited in connection with this offering or other ownership changes.***

We have incurred substantial losses during our history and do not expect to become profitable in the near future, and we may never achieve profitability. To the extent that we continue to generate

taxable losses, unused losses will carry forward to offset future taxable income, if any, until such unused losses expire (if at all).

Under recently enacted U.S. tax legislation, federal net operating loss, or NOL, carryforwards generated in periods after December 31, 2017, may be carried forward indefinitely but may only be used to offset 80% of our taxable income annually. Our NOL carryforwards are subject to review and possible adjustment by the Internal Revenue Service, or the IRS, and state tax authorities. Under Section 382 of the Internal Revenue Code of 1986, as amended, or the Code, our federal NOL carryforwards may become subject to an annual limitation in the event of certain cumulative changes in the ownership interest of significant stockholders over a three-year period in excess of 50 percentage points. Our ability to utilize our NOL carryforwards and other tax attributes to offset future taxable income or tax liabilities may be limited as a result of ownership changes, including potential changes in connection with this offering. Similar rules may apply under state tax laws. We have not yet determined the amount of the cumulative change in our ownership resulting from this offering or other transactions, or any resulting limitations on our ability to utilize our NOL carryforwards and other tax attributes. If we earn taxable income, such limitations could result in increased future tax liability to us and our future cash flows could be adversely affected. We have recorded a full valuation allowance related to our NOLs and other deferred tax assets due to the uncertainty of the ultimate realization of the future benefits of those assets.

***Recent U.S. tax legislation may materially adversely affect our financial condition, results of operations and cash flows.***

The Tax Act has significantly changed the U.S. federal income taxation of U.S. corporations, including by reducing the U.S. corporate income tax rate and revising the rules governing NOLs. Many of these changes became effective beginning in 2018, without any transition periods or grandfathering for existing transactions. The legislation is unclear in many respects and could be subject to potential amendments and technical corrections, as well as interpretations and implementing regulations by the U.S. Treasury Department and the IRS, any of which could lessen or increase certain adverse impacts of the legislation. In addition, it is unclear how these U.S. federal income tax changes will affect state and local taxation, which often uses federal taxable income as a starting point for computing state and local tax liabilities.

There may be other material adverse effects resulting from the legislation that we have not yet identified. While some of the changes made by the tax legislation may adversely affect us in one or more reporting periods and prospectively, other changes may be beneficial on a going forward basis. We continue to work with our tax advisors to determine the full impact that the recent tax legislation as a whole will have on us. We urge our investors to consult with their legal and tax advisors with respect to such legislation and the potential tax consequences of investing in our common stock.

***We could be subject to securities class action litigation.***

In the past, securities class action litigation has often been brought against a company following a decline in the market price of its securities. This risk is especially relevant for us, because biotechnology and pharmaceutical companies have experienced significant stock price volatility in recent years. If we face such litigation, it could result in substantial costs and a diversion of management’s attention and resources, which could harm our business.

## SPECIAL NOTE REGARDING FORWARD-LOOKING STATEMENTS

This prospectus contains forward-looking statements. All statements other than statements of historical facts contained in this prospectus, including statements regarding our future results of operations and financial position, business strategy, research and development plans, the anticipated timing, costs, design and conduct of our planned clinical trials for vonoprazan, our only product candidate, the timing and likelihood of regulatory filings and approvals for vonoprazan, our ability to commercialize vonoprazan, if approved, the pricing and reimbursement of vonoprazan, if approved, the potential to develop future product candidates, the potential benefits of strategic collaborations and our intent to enter into any strategic arrangements, the timing and likelihood of success, plans and objectives of management for future operations, and future results of anticipated product development efforts, are forward-looking statements. These statements involve known and unknown risks, uncertainties and other important factors that may cause our actual results, performance or achievements to be materially different from any future results, performance or achievements expressed or implied by the forward-looking statements.

In some cases, you can identify forward-looking statements by terms such as “may,” “will,” “should,” “expect,” “plan,” “anticipate,” “could,” “intend,” “target,” “project,” “contemplates,” “believes,” “estimates,” “predicts,” “potential” or “continue” or the negative of these terms or other similar expressions. The forward-looking statements in this prospectus are only predictions. We have based these forward-looking statements largely on our current expectations and projections about future events and financial trends that we believe may affect our business, financial condition and results of operations. These forward-looking statements speak only as of the date of this prospectus and are subject to a number of risks, uncertainties and assumptions described under the sections titled “Risk Factors” and “Management’s Discussion and Analysis of Financial Condition and Results of Operations” and elsewhere in this prospectus. Because forward-looking statements are inherently subject to risks and uncertainties, some of which cannot be predicted or quantified and some of which are beyond our control, you should not rely on these forward-looking statements as predictions of future events. The events and circumstances reflected in our forward-looking statements may not be achieved or occur and actual results could differ materially from those projected in the forward-looking statements. Moreover, we operate in an evolving environment. New risk factors and uncertainties may emerge from time to time, and it is not possible for management to predict all risk factors and uncertainties. Except as required by applicable law, we undertake no obligation to publicly update or revise any forward-looking statements contained herein, whether as a result of any new information, future events, changed circumstances or otherwise. You should, however, review the factors and risks we describe in the reports we will file from time to time with the SEC after the date of this prospectus. See the section titled “Where You Can Find More Information.”

In addition, statements that “we believe” and similar statements reflect our beliefs and opinions on the relevant subject. These statements are based upon information available to us as of the date of this prospectus, and while we believe such information forms a reasonable basis for such statements, such information may be limited or incomplete, and our statements should not be read to indicate that we have conducted an exhaustive inquiry into, or review of, all potentially available relevant information. These statements are inherently uncertain and you are cautioned not to rely unduly upon them.

## MARKET AND INDUSTRY DATA

We obtained the industry, market and competitive position data used throughout this prospectus from our own internal estimates and research, as well as from independent market research, industry and general publications and surveys, governmental agencies and publicly available information in addition to research, surveys and studies conducted by third parties. Internal estimates are derived from publicly available information released by industry analysts and third-party sources, our internal research and our industry experience, and are based on assumptions made by us based on such data and our knowledge of our industry and market, which we believe to be reasonable. In some cases, we do not expressly refer to the sources from which this data is derived. In that regard, when we refer to one or more sources of this type of data in any paragraph, you should assume that other data of this type appearing in the same paragraph is derived from the same sources, unless otherwise expressly stated or the context otherwise requires. In addition, while we believe the industry, market and competitive position data included in this prospectus is reliable and based on reasonable assumptions, such data involve risks and uncertainties and are subject to change based on various factors, including those discussed in the section titled “Risk Factors.” These and other factors could cause results to differ materially from those expressed in the estimates made by the independent parties or by us.

## USE OF PROCEEDS

We estimate that the net proceeds to us from the sale of the common stock that we are offering will be approximately $136.8 million (or $157.7 million if the underwriters exercise their option to purchase additional shares in full), assuming an initial public offering price of $19.00 per share, the midpoint of the price range set forth on the cover page of this prospectus, and after deducting the estimated underwriting discounts and commissions and estimated offering expenses payable by us.

Each $1.00 increase (decrease) in the assumed initial public offering price of $19.00 per share would increase (decrease) the net proceeds to us from this offering by approximately $7.3 million, assuming the number of shares offered by us, as set forth on the cover page of this prospectus, remains the same and after deducting the estimated underwriting discounts and commissions and estimated offering expenses payable by us. Each increase (decrease) of 1.0 million shares in the number of shares offered by us would increase (decrease) the net proceeds to us from this offering, after deducting the estimated underwriting discounts and commissions and estimated offering expenses payable by us, by approximately $17.7 million, assuming the assumed initial public offering price stays the same.

The principal purposes of this offering are to obtain additional capital to support our operations, to create a public market for our common stock and to facilitate our future access to the public equity markets. We intend to use approximately $100.0 million of the net proceeds from this offering to fund the clinical development of vonoprazan and the remainder for working capital and general corporate purposes, including pre-commercial activities.

We may also use a portion of the remaining net proceeds and our existing cash and cash equivalents to in-license, acquire, or invest in complementary businesses, technologies, products or assets. However, we have no current commitments or obligations to do so.

We believe, based on our current operating plan, that the net proceeds from this offering together with our existing cash and cash equivalents, will be sufficient to fund our operations for at least the next 24 months, although there can be no assurance in that regard. In particular, we expect that the net proceeds from this offering will allow us to complete our planned Phase 3 clinical trials of vonoprazan in the treatment of erosive esophagitis and *H. pylori* infection. However, our expected use of proceeds from this offering described above represents our current intentions based on our present plans and business condition. We cannot predict with certainty all of the particular uses of the net from this offering or the actual amounts that we will spend on the uses set forth above.

The amounts and timing of our actual expenditures will depend on numerous factors, including the time and cost necessary to conduct our planned clinical trials, the results of such trials, and other factors described in the section titled “Risk Factors,” as well as the amount of cash used in our operations and any unforeseen cash needs. Therefore, our actual expenditures may differ materially from the estimates described above. We may find it necessary or advisable to use the net proceeds for other purposes, and we will have broad discretion in the application of the net proceeds.

Pending the uses described above, we plan to invest the net proceeds from this offering in short- and intermediate-term, investment grade interest-bearing instruments.

## DIVIDEND POLICY

We have never declared or paid any cash dividends on our capital stock. We intend to retain future earnings, if any, to finance the operation of our business and do not anticipate paying any cash dividends in the foreseeable future. Any future determination related to dividend policy will be made at the discretion of our board of directors after considering our financial condition, results of operations, capital requirements, business prospects and other factors the board of directors deems relevant, and subject to the restrictions contained in any future financing instruments. In addition, under the terms of our Loan Agreement, we are prohibited from paying any cash dividends without the consent of the lenders.

## CAPITALIZATION

The following table sets forth our cash and cash equivalents and capitalization as of June 30, 2019:

- on an actual basis;
- on a pro forma basis to reflect (i) the automatic conversion of the May 2019 Notes into an aggregate of 6,106,940 shares of our common stock immediately prior to the closing of this offering (based on an assumed initial public offering price of $19.00 per share, the midpoint of the price range set forth on the cover page of this prospectus, and assuming the conversion occurs on October 28, 2019), (ii) the reclassification of the Takeda Warrant to stockholders' equity (deficit), and (iii) the filing and effectiveness of our amended and restated certificate of incorporation immediately prior to the closing of this offering; and
- on a pro forma as adjusted basis to give further effect to our issuance and sale of 7,900,000 shares of our common stock in this offering at an assumed initial public offering price of $19.00 per share, after deducting the estimated underwriting discounts and commissions and estimated offering expenses payable by us.

The pro forma and pro forma as adjusted information below is illustrative only, and our cash and cash equivalents and capitalization following the closing of this offering will be adjusted based on the actual initial public offering price and other terms of this offering determined at pricing. You should read this information in conjunction with our combined financial statements and related notes included in this prospectus and the section titled "Management's Discussion and Analysis of Financial Condition and Results of Operations" and other financial information contained in this prospectus.

| | As of June 30, 2019 | | |
|---|---|---|---|
| (in thousands, except share and par value data) | Actual (unaudited) | Pro Forma (unaudited) | Pro Forma As Adjusted[1] (unaudited) |
| Cash and cash equivalents | $ 82,917 | $ 82,917 | $219,710 |
| Capitalization: | | | |
| Convertible promissory notes payable at fair value (including accrued interest) | $ 93,559 | $ – | $ – |
| Warrant liabilities | 49,597 | 426 | 426 |
| Long-term debt, including final payment fee and net of debt discount | 24,512 | 24,512 | 24,512 |
| Stockholders' equity (deficit): | | | |
| Preferred stock, $0.0001 par value; no shares authorized, issued and outstanding, actual; 40,000,000 shares authorized and no shares issued and outstanding, pro forma and pro forma as adjusted | – | – | – |
| Common stock, $0.0001 par value; 50,000,000 shares authorized, 11,876,518 shares issued and 7,219,268 shares outstanding, actual; 400,000,000 shares authorized, 17,983,458 shares issued and 13,326,208 shares outstanding, pro forma; 400,000,000 shares authorized, 25,883,458 shares issued and 21,226,208 shares outstanding, pro forma as adjusted | – | 1 | 2 |
| Additional paid-in capital | 5,916 | 148,645 | 285,437 |
| Accumulated deficit | (90,301) | (90,301) | (90,301) |
| Total stockholders' equity (deficit) | (84,385) | 58,345 | 195,138 |
| Total capitalization | $ 83,283 | $ 83,283 | $220,076 |

(1) Each $1.00 increase (decrease) in the assumed initial public offering price of $19.00 per share, the midpoint of the price range set forth on the cover page of this prospectus, would increase (decrease) the pro forma as adjusted amount of each of our cash and cash equivalents, total stockholders' equity (deficit) and total capitalization by approximately $7.3 million, assuming that the number of shares offered by us, as set forth on the cover page of this prospectus, remains the same and after deducting the estimated underwriting discounts and commissions and estimated offering expenses payable by us. Each increase (decrease) of 1.0 million shares in the number of shares offered by us at the assumed initial public offering price of $19.00 per share would increase (decrease) the pro forma as adjusted amount of each of our cash and cash equivalents, total stockholders' equity (deficit) and total capitalization by approximately $17.7 million, after deducting the estimated underwriting discounts and commissions and estimated offering expenses payable by us.

The number of shares of common stock issued and outstanding pro forma and pro forma as adjusted in the table above is based on 17,983,458 shares of our common stock outstanding as of June 30, 2019, including 4,657,250 shares subject to forfeiture or our right of repurchase, and gives effect to the automatic conversion of the May 2019 Notes into an aggregate of 6,106,940 shares of our common stock immediately prior to the closing of this offering (based on an assumed initial public offering price of $19.00 per share, the midpoint of the price range set forth on the cover page of this prospectus, and assuming the conversion occurs on October 28, 2019), and excludes:

- 7,588,000 shares of common stock issuable to Takeda upon the exercise of the Takeda Warrant as of June 30, 2019, at an exercise price of $0.00004613 per share;
- 1,400,528 shares of common stock issuable upon exercise of stock options granted after June 30, 2019, at a weighted-average exercise price of $9.10 per share;
- 2,700,000 shares of our common stock reserved for future issuance under our 2019 Plan, which will become effective in connection with this offering (which number does not include any potential evergreen increases pursuant to the terms of the 2019 Plan);
- 270,000 shares of common stock reserved for future issuance under our ESPP, which will become effective in connection with this offering (which number does not include any potential evergreen increases pursuant to the terms of the ESPP); and
- 16,446 shares of our common stock which may become issuable to the lenders under our Loan Agreement upon the exercise of the Lender Warrants, at an exercise price of $15.20 per share (based on an assumed initial public offering price of $19.00 per share, the midpoint of the price range set forth on the cover page of this prospectus), which warrants will only become exercisable if and when we borrow an additional $25.0 million under our Loan Agreement.

A $1.00 increase in the assumed initial public offering price of $19.00 per share, the midpoint of the price range set forth on the cover page of this prospectus, would decrease the number of shares of our common stock issued upon conversion of the May 2019 Notes by 305,346 shares. A $1.00 decrease in the assumed initial public offering price of $19.00 per share would increase the number of shares of our common stock issued on conversion of the May 2019 Notes by 339,275 shares.

## DILUTION

If you invest in our common stock in this offering, your ownership interest will be immediately diluted to the extent of the difference between the initial public offering price per share and the pro forma as adjusted net tangible book value per share of our common stock after this offering.

As of June 30, 2019, our historical net tangible book value (deficit) was $(84.4) million, or $(7.11) per share of our common stock, based on 11,876,518 shares of common stock issued and outstanding as of such date, including 4,657,250 shares subject to forfeiture or our right of repurchase as of such date. Our historical net tangible book value per share represents total tangible assets less total liabilities, divided by the number of shares of common stock outstanding at June 30, 2019.

On a pro forma basis, after giving effect to (i) the automatic conversion of the May 2019 Notes into an aggregate of 6,106,940 shares of our common stock immediately prior to the closing of this offering (based on an assumed initial public offering price of $19.00 per share, the midpoint of the price range set forth on the cover page of this prospectus, and assuming the conversion occurs on October 28, 2019), and (ii) the reclassification of the Takeda Warrant to stockholders' equity (deficit), our pro forma net tangible book value as of June 30, 2019 would have been approximately $58.3 million, or approximately $3.24 per share of our common stock.

After giving further effect to the sale of 7,900,000 shares of common stock in this offering at an assumed initial public offering price of $19.00 per share, the midpoint of the price range set forth on the cover page of this prospectus, and after deducting the estimated underwriting discounts and commissions and estimated offering expenses payable by us, our pro forma as adjusted net tangible book value as of June 30, 2019 would have been approximately $195.1 million, or approximately $7.54 per share. This amount represents an immediate increase in pro forma net tangible book value of approximately $4.30 per share to our existing stockholders and an immediate dilution in pro forma net tangible book value of approximately $11.46 per share to new investors purchasing shares of common stock in this offering.

Dilution per share to new investors is determined by subtracting pro forma as adjusted net tangible book value per share after this offering from the initial public offering price per share paid by new investors. The following table illustrates this dilution (without giving effect to any exercise by the underwriters of their option to purchase additional shares):

| | | |
|---|---|---|
| Assumed initial public offering price per share | | $19.00 |
| Historical net tangible book value (deficit) per share as of June 30, 2019 | $ (7.11) | |
| Pro forma increase in historical net tangible book value per share as of June 30, 2019 attributable to the pro forma adjustments described above | 10.35 | |
| Pro forma net tangible book value per share as of June 30, 2019 | 3.24 | |
| Increase in pro forma net tangible book value per share attributable to new investors participating in this offering | 4.30 | |
| Pro forma as adjusted net tangible book value per share after this offering | | 7.54 |
| Dilution per share to new investors participating in this offering | | $11.46 |

A $1.00 increase in the assumed initial public offering price of $19.00 per share, the midpoint of the price range set forth on the cover page of this prospectus, would decrease the number of shares of our common stock issued upon conversion of the May 2019 Notes by 305,346 shares, and would increase the pro forma as adjusted net tangible book value per share after this offering by approximately $0.38, and decrease the dilution in pro forma net tangible book value per share to new

investors by approximately $0.38, assuming that the number of shares offered by us, as set forth on the cover page of this prospectus, remains the same and after deducting the estimated underwriting discounts and commissions and the estimated offering expenses payable by us. A $1.00 decrease in the assumed initial public offering price of $19.00 per share would increase the number of shares of our common stock issued upon conversion of the May 2019 Notes by 339,275 shares, and would decrease the pro forma as adjusted net tangible book value per share after this offering by approximately $0.38, and increase the dilution in pro forma net tangible book value per share to new investors by approximately $0.38, assuming that the number of shares offered by us, as set forth on the cover page of this prospectus, remains the same and after deducting the estimated underwriting discounts and commissions and the estimated offering expenses payable by us.

Each increase of 1.0 million shares in the number of shares offered by us would increase our pro forma as adjusted net tangible book value per share after this offering by approximately $0.38 and decrease the dilution to investors participating in this offering by approximately $0.38, assuming that the assumed initial public offering price of $19.00 per share remains the same, and after deducting the estimated underwriting discounts and commissions and the estimated offering expenses payable by us. Each decrease of 1.0 million shares in the number of shares offered by us would decrease our pro forma as adjusted net tangible book value per share after this offering by approximately $0.41 and increase the dilution to investors participating in this offering by approximately $0.41, assuming that the assumed initial public offering price of $19.00 per share remains the same, and after deducting the estimated underwriting discounts and commissions and the estimated offering expenses payable by us.

If the underwriters exercise their option to purchase additional shares of our common stock in full in this offering, the pro forma as adjusted net tangible book value after the offering would be approximately $7.98 per share, the increase in pro forma as adjusted net tangible book value per share to existing stockholders would be approximately $4.74 and the dilution per share to new investors would be $11.02, in each case assuming an initial public offering price of $19.00 per share, the midpoint of the price range set forth on the cover page of this prospectus.

The following table summarizes on the pro forma as adjusted basis described above, as of June 30, 2019, the differences between the number of shares purchased from us, the total consideration paid to us in cash and the average price per share paid by existing stockholders for shares issued prior to this offering and the price to be paid by new investors in this offering. The calculations below are based on an assumed initial public offering price of $19.00 per share, the midpoint of the price range set forth on the cover page of the prospectus, before deducting the estimated underwriting discounts and commissions and estimated offering expenses payable by us.

| | Shares Purchased | | Total Consideration | | Weighted-Average Price Per Share |
|---|---|---|---|---|---|
| | Number | Percent | Amount | Percent | |
| Existing stockholders before this offering | 17,983,458 | 69% | $ 92,826,000 | 38% | $ 5.16 |
| New investors participating in this offering | 7,900,000 | 31 | 150,100,000 | 62 | $ 19.00 |
| Total | 25,883,458 | 100% | $242,926,000 | 100% | |

If the Takeda Warrant and Lender Warrants had been exercised as of June 30, 2019, the pro forma as adjusted net tangible book value after this offering would be approximately $195.4 million, or approximately $5.83 per share, and total dilution per share to new investors would be approximately $13.17 per share.

If the underwriters exercise their option to purchase additional shares of our common stock in full:

- the percentage of shares of common stock held by existing stockholders before this offering will decrease to approximately 66% of the total number of shares of our common stock outstanding after this offering; and
- the number of shares held by new investors participating in this offering will increase to 9,085,000, or approximately 34% of the total number of shares of our common stock outstanding after this offering.

The foregoing tables and calculations on a pro forma and pro forma as adjusted basis are based on 17,983,458 shares of our common stock outstanding as of June 30, 2019, including 4,657,250 shares subject to forfeiture or our right of repurchase, and gives effect to the automatic conversion of the May 2019 Notes into an aggregate of 6,106,940 shares of our common stock immediately prior to the closing of this offering (based on an assumed initial public offering price of $19.00 per share, the midpoint of the price range set forth on the cover page of this prospectus, and assuming the conversion occurs on October 28, 2019) and excludes:

- 7,588,000 shares of common stock issuable to Takeda upon the exercise of the Takeda Warrant as of June 30, 2019, at an exercise price of $0.00004613 per share;
- 1,400,528 shares of common stock issuable upon exercise of stock options granted after June 30, 2019, at a weighted-average exercise price of $9.10 per share;
- 2,700,000 shares of our common stock reserved for future issuance under our 2019 Plan, which will become effective in connection with this offering (which number does not include any potential evergreen increases pursuant to the terms of the 2019 Plan);
- 270,000 shares of common stock reserved for future issuance under our ESPP, which will become effective in connection with this offering (which number does not include any potential evergreen increases pursuant to the terms of the ESPP); and
- 16,446 shares of our common stock which may become issuable to the lenders under our Loan Agreement upon the exercise of the Lender Warrants, at an exercise price of $15.20 per share (based on an assumed initial public offering price of $19.00 per share, the midpoint of the price range set forth on the cover page of this prospectus) which warrants will only become exercisable if and when we borrow an additional $25.0 million under our Loan Agreement.

To the extent any outstanding options, warrants or other rights are exercised, or we issue additional equity or convertible securities in the future, there will be further dilution to new investors.

## SELECTED COMBINED FINANCIAL DATA

The following tables set forth our selected historical combined financial data as of, and for the periods ended on, the dates indicated. The combined financial statements include the accounts of our company and YamadaCo IIA, Inc., both of which were entities under common control prior to the Merger. We have derived the selected combined statements of operations data for the year ended December 31, 2018 and the selected combined balance sheet data as of December 31, 2018 from our audited combined financial statements included elsewhere in this prospectus. We have derived the selected combined statements of operations data for the six months ended June 30, 2018 and 2019 and the selected combined balance sheet data as of June 30, 2019 from our unaudited combined financial statements included elsewhere in this prospectus. The unaudited combined financial statements have been prepared on a basis consistent with our audited combined financial statements included in this prospectus and, in the opinion of management, reflect all adjustments, consisting only of normal recurring adjustments, necessary to fairly state our results of operations for the six months ended June 30, 2018 and 2019 and financial position as of June 30, 2019. You should read these data together with our combined financial statements and related notes included elsewhere in this prospectus and the section titled "Management's Discussion and Analysis of Financial Condition and Results of Operations." Our historical results for any prior period are not necessarily indicative of our future results.

| (in thousands, except share and per share data) | Year Ended December 31, 2018 | Six Months Ended June 30, 2018 | Six Months Ended June 30, 2019 |
|---|---|---|---|
| | | (unaudited) | |
| **Combined Statements of Operations Data:** | | | |
| Operating expenses: | | | |
| Research and development | $ 20 | $ – | $ 3,201 |
| In-process research and development | – | – | 78,897 |
| General and administrative (includes related party amounts of $321, $124 and $18, respectively) | 1,205 | 506 | 2,142 |
| Total operating expenses | 1,225 | 506 | 84,240 |
| Loss from operations | (1,225) | (506) | (84,240) |
| Other income (expense): | | | |
| Interest income | – | – | 101 |
| Interest expense (includes related party amounts of $(13), $(4) and $(82), respectively) | (13) | (4) | (1,148) |
| Change in fair value of warrant liabilities (includes related party amounts of $0, $0 and $(1,277), respectively) | – | – | (1,284) |
| Change in fair value of convertible promissory notes (includes related party amounts of $(50), $(4) and $(502), respectively) | (50) | (4) | (2,442) |
| Total other income (expense) | (63) | (8) | (4,773) |
| Net loss | $ (1,288) | $ (514) | $ (89,013) |
| Net loss per share, basic and diluted[(1)] | $ (0.21) | $ (0.10) | $ (13.40) |
| Weighted-average shares of common stock outstanding, basic and diluted[(1)] | 6,051,675 | 5,331,270 | 6,640,394 |
| Pro forma net loss per share, basic and diluted (unaudited)[(1)] | $ (0.20) | | $ (9.85) |
| Pro forma weighted-average shares of common stock outstanding, basic and diluted (unaudited)[(1)] | 6,098,429 | | 8,578,296 |

(1) See Note 1 to our combined financial statements included elsewhere in this prospectus for an explanation of the method used to calculate the historical and pro forma net loss per share, basic and diluted, and the number of shares used in the computation of the per share amounts.

| (in thousands) | As of December 31, 2018 | As of June 30, 2019 (unaudited) |
|---|---|---|
| **Combined Balance Sheet Data:** | | |
| Cash and cash equivalents | $ 879 | $ 82,917 |
| Working capital (deficit)[1] | (1,286) | (60,210) |
| Total assets | 902 | 84,879 |
| Convertible promissory notes payable at fair value (including accrued interest) | 1,963 | 93,559 |
| Warrant liabilities | – | 49,597 |
| Long-term debt, including final payment fee and net of debt discount | – | 24,512 |
| Accumulated deficit | (1,288) | (90,301) |
| Total stockholders' equity (deficit) | (1,286) | (84,385) |

(1) We define working capital (deficit) as current assets less current liabilities. See our combined financial statements included elsewhere in this prospectus for further details regarding our current assets and current liabilities.

## MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS

*You should read the following discussion and analysis of our financial condition and results of operations together with our combined financial statements and related notes included elsewhere in this prospectus. Some of the information contained in this discussion and analysis are set forth elsewhere in this prospectus, including information with respect to our plans and strategy for our business and related financing, and includes forward-looking statements that involve risks and uncertainties. As a result of many factors, including those factors set forth in the section titled "Risk Factors," our actual results could differ materially from the results described in or implied by the forward-looking statements contained in the following discussion and analysis.*

### Overview

We are a late clinical-stage biopharmaceutical company focused on developing and commercializing novel treatments for GI diseases. Our initial product candidate, vonoprazan, is an oral small molecule P-CAB. P-CABs are a novel class of medicines that block acid secretion in the stomach. Vonoprazan has rapid, potent, and durable anti-secretory effects and has demonstrated clinical benefits over the current standard of care as a single agent in the treatment of GERD, and in combination with antibiotics for the treatment of *H. pylori* infection. Takeda developed vonoprazan and has received marketing approval in nine countries in Asia and Latin America. Vonoprazan generated over $500 million in net sales in its fourth full year on the market since its approval in Japan in late 2014. In May 2019, we in-licensed the U.S., European, and Canadian rights to vonoprazan from Takeda. We plan to initiate two pivotal Phase 3 clinical trials of vonoprazan in the fourth quarter of 2019. We believe that the successful completion of our Phase 3 clinical trials, together with the existing clinical data, will support regulatory submissions in 2021 and 2022 for marketing approval for the treatment of *H. pylori* infection and erosive esophagitis, respectively. If approved, we plan to independently commercialize vonoprazan in the United States. We also plan to seek commercial partnerships for vonoprazan in Europe and Canada, expand development of vonoprazan across indications, dosing regimens and alternative formulations and packaging, and in-license or acquire additional clinical or commercial stage product candidates for the treatment of GI diseases in a capital efficient manner.

We commenced our operations in 2018 and have devoted substantially all of our resources to date to organizing and staffing our company, business planning, raising capital, in-licensing our initial product candidate, vonoprazan, meeting with regulatory authorities, preparing for our planned Phase 3 clinical trials of vonoprazan, and providing other general and administrative support for these operations. Our operations to date have been funded primarily through the issuance of convertible promissory notes and commercial bank debt. From our inception through June 30, 2019, we have raised aggregate gross proceeds of $90.3 million from the issuance of convertible promissory notes and $25.0 million of commercial bank debt. As of June 30, 2019, we had cash and cash equivalents of $82.9 million. Based on our current operating plan, we believe that our existing cash and cash equivalents, together with the estimated net proceeds from this offering, will be sufficient to meet our anticipated cash requirements through at least the next 24 months.

We do not have any products approved for sale and have incurred net losses since our inception. Our net losses for the year ended December 31, 2018 and the six months ended June 30, 2019 were $1.3 million and $89.0 million, respectively. As of June 30, 2019, we had an accumulated deficit of $90.3 million. Our net losses may fluctuate significantly from quarter-to-quarter and year-to-year, depending on the timing of our clinical development activities, other research and development activities and pre-commercialization activities. We expect our expenses and operating losses will increase substantially as we advance vonoprazan through clinical trials, seek regulatory approval for

vonoprazan, expand our clinical, regulatory, quality, manufacturing and commercialization capabilities, incur significant commercialization expenses for marketing, sales, manufacturing and distribution if we obtain marketing approval for vonoprazan, protect our intellectual property, expand our general and administrative support functions, including hiring additional personnel, and incur additional costs associated with operating as a public company.

We have never generated any revenue and do not expect to generate any revenues from product sales unless and until we successfully complete development and obtain regulatory approval for vonoprazan, which will not be for several years, if ever. Accordingly, until such time as we can generate significant revenue from sales of vonoprazan, if ever, we expect to finance our cash needs through equity offerings, our existing Loan Agreement, debt financings, or other capital sources, including potential collaborations, licenses and other similar arrangements. However, we may be unable to raise additional funds or enter into such other arrangements when needed on favorable terms or at all. Our failure to raise capital or enter into such other arrangements when needed would have a negative impact on our financial condition and could force us to delay, limit, reduce or terminate our product development or future commercialization efforts or grant rights to develop and market product candidates that we would otherwise prefer to develop and market ourselves.

***Financial Operations Overview***

Our combined financial statements include the accounts of Phathom (the receiving entity) and YamadaCo IIA prior to being merged into a single entity effective March 13, 2019. Phathom and YamadaCo IIA were entities under common control of Frazier, as a result of, among other things, Frazier's: (i) ownership of a majority of the outstanding capital stock of both companies; (ii) financing of both companies; (iii) control of the board of directors of both companies; and (iv) management of both companies. Both Phathom and YamadaCo IIA were formed for the purpose of identifying potential assets around which to form an operating company. As the merged entities were under common control, the combined financial statements report the financial position, results of operations and cash flows of Phathom and YamadaCo IIA as though the transfer of net assets and equity interests had occurred at the beginning of 2018. All intercompany accounts and transactions have been eliminated in combination.

***License Agreement with Takeda***

On May 7, 2019, we and Takeda entered into the Takeda License, pursuant to which we in-licensed the U.S., European, and Canadian rights to vonoprazan. During the term of the Takeda License, we and our affiliates are not permitted to commercialize any pharmaceutical product, other than vonoprazan, that treats acid-related disorders, except for certain generic and OTC competing products in specified circumstances. We will be responsible at our cost for the development, manufacture and commercialization of vonoprazan products. We are required to use commercially reasonable efforts to develop and commercialize the vonoprazan products in our licensed territory.

Under the Takeda License, Takeda has the sole right and authority, with our input, to prepare, file, prosecute, and maintain all Takeda and joint patents on a worldwide basis at its own cost. We are responsible, at our cost, for preparing, filing, prosecuting, and maintaining patents on inventions made solely by us in connection with vonoprazan, subject to input from Takeda.

We paid Takeda upfront consideration consisting of a cash fee of $25.0 million, 1,084,000 shares of our common stock, a warrant to purchase 7,588,000 shares of our common stock at an exercise price of $0.00004613 per share, or the Takeda Warrant, and issued Takeda a right to receive an additional common stock warrant, or the Takeda Warrant Right, if Takeda's fully-diluted ownership of the Company represents less than a certain specified percentage of the fully-diluted capitalization,

including shares issuable upon conversion of outstanding convertible promissory notes, calculated immediately prior to the closing of our initial public offering. We agreed to make milestone payments to Takeda upon achieving certain tiered aggregate annual net sales of licensed products in the United States, Europe and Canada up a total maximum milestone amount of $250.0 million. We also agreed to make tiered royalty payments at percentages in the very low to mid double digits on net sales of licensed products, subject to specified offsets and reductions. Royalties will be payable, on a product-by-product and country-by-country basis from the first commercial sale of such product in such country, until the latest of expiration of the licensed patents covering the applicable product, expiration of regulatory exclusivity in such country, or 15 years following first commercial sale in such country. For additional information regarding the Takeda License, see “Business—Intellectual Property—License Agreement with Takeda Pharmaceutical Company Limited.”

## Components of Results of Operations

### *Operating Expenses*

#### *Research and Development*

To date, our research and development expenses have related to the development of vonoprazan. Research and development expenses are recognized as incurred and payments made prior to the receipt of goods or services to be used in research and development are capitalized until the goods or services are received.

Research and development expenses include:

- salaries, payroll taxes, employee benefits, and stock-based compensation charges for those individuals involved in research and development efforts;
- external research and development expenses incurred under agreements with contract research organizations, or CROs, and consultants to conduct and support our planned clinical trials of vonoprazan; and
- costs related to manufacturing vonoprazan clinical trials.

We plan to substantially increase our research and development expenses for the foreseeable future as we continue the development of vonoprazan. We cannot determine with certainty the timing of initiation, the duration or the completion costs of current or future clinical trials and nonclinical studies of vonoprazan or any future product candidates due to the inherently unpredictable nature of clinical and preclinical development. Clinical and preclinical development timelines, the probability of success and development costs can differ materially from expectations. In addition, we cannot forecast which product candidates may be subject to future collaborations, when such arrangements will be secured, if at all, and to what degree such arrangements would affect our development plans and capital requirements.

Our future clinical development costs may vary significantly based on factors such as:

- per patient trial costs;
- the number of trials required for approval;
- the number of sites included in the trials;
- the countries in which the trials are conducted;
- the length of time required to enroll eligible patients;
- the number of patients that participate in the trials;

- the number of doses evaluated in the trials;
- the drop-out or discontinuation rates of patients;
- potential additional safety monitoring requested by regulatory agencies;
- the duration of patient participation in the trials and follow-up;
- the phase of development of the product candidate; and
- the efficacy and safety profile of the product candidate.

***In-Process Research and Development***

In-process research and development expenses relate to the Takeda License, and include the $78.9 million purchase price of the acquired research and development assets. The purchase price of the Takeda License consisted of the following: (i) $25.0 million in cash; (ii) issuance to Takeda of 1,084,000 shares of our common stock at a fair value of $5.9 million; (iii) issuance of the Takeda Warrant at an initial fair value of $47.9 million; (iv) issuance of the Takeda Warrant Right, with a nominal initial fair value due to the low probability of issuance; and (v) $0.1 million of transaction costs incurred by us. The fair value of the Takeda Warrant and Takeda Warrant Right were determined using the methodologies described below under “Change in Fair Value of Warrant Liabilities,” and the fair value of the common stock was determined using the methodologies described below under “Critical Accounting Policies and Significant Judgments and Estimates—Common Stock Valuations.”

***General and Administrative***

General and administrative expenses consist of salaries and employee-related costs, including stock-based compensation, for personnel in executive, finance and other administrative functions, legal fees relating to intellectual property and corporate matters, and professional fees for accounting and consulting services. We anticipate that our general and administrative expenses will increase in the future to support our continued research and development activities, pre-commercial preparation activities for vonoprazan and, if any future product candidate receives marketing approval, commercialization activities. We also anticipate increased expenses related to audit, legal, regulatory, and tax-related services associated with maintaining compliance with exchange listing and SEC requirements, director and officer insurance premiums, and investor relations costs associated with operating as a public company.

***Interest Income***

Interest income consists of interest on our money market fund.

***Interest Expense***

Interest expense consists of (i) interest on our outstanding convertible promissory notes at per annum interest rates ranging from 1.68% to 6.00% and (ii) interest on our outstanding commercial bank debt at a floating per annum interest rate (7.25% as of June 30, 2019) and amortization of the commercial bank debt discount recorded in connection with the fair value of warrants issued to the lenders, debt issuance costs incurred and the obligation to make a final payment fee.

***Change in Fair Value of Warrant Liabilities***

In connection with the Takeda License, we issued the Takeda Warrant and Takeda Warrant Right, or together the Takeda Warrants. In connection with our commercial bank debt, we issued the

lenders warrants to purchase our capital stock, or the Lender Warrants. The Takeda Warrants are accounted for as liabilities as they do not meet all the conditions for equity classification due to (i) insufficient authorized shares for the Takeda Warrant and (ii) the Takeda Warrant Right is not indexed to our own stock. The Lender Warrants are accounted for as liabilities as they contain a holder put right under which the lenders could require us to pay cash in exchange for the warrants. We adjust the carrying value of our warrant liabilities to their estimated fair value at each reporting date, with any change in fair value of the warrant liabilities recorded as an increase or decrease to change in fair value of warrant liabilities in the combined statements of operations.

The fair value of the Takeda Warrants is derived from the model used to estimate the fair value of our common stock and the fair value of the Lender Warrants is estimated using a probability-weighted model considering initial public offering and non-initial public offering scenarios. The initial public offering scenarios utilize a binomial lattice model to estimate a distribution of total equity values as of a projected initial public offering date. The non-initial public offering scenario utilizes the repurchase price associated with the warrant put right discounted to present value based on venture capital rates of return and the term associated with the put right.

Upon the closing of this offering, (i) the Takeda Warrant will become reclassified to stockholders' equity and require a final adjustment to fair value, (ii) the Takeda Warrant Right (based on an assumed initial public offering price of $19.00 per share, the midpoint of the price range set forth on the cover of this prospectus) will expire without effect since no fair value has been allocated to it, and (iii) the Lender Warrants, as a result of a put option, will continue as warrant liabilities adjusted to fair value at each reporting date.

***Change in Fair Value of Convertible Promissory Notes***

We issued convertible promissory notes in 2018 and 2019 for which we have elected the fair value option. We adjust the carrying value of our convertible promissory notes to their estimated fair value at each reporting date, with any change in fair value of the convertible promissory notes recorded as an increase or decrease to change in fair value of convertible promissory notes in our combined statements of operations. All outstanding convertible promissory notes and related accrued interest will convert to shares of our common stock upon the closing of this offering.

Prior to their exchange into convertible promissory notes issued in May 2019, the fair value of convertible promissory notes issued from inception through April 2019 was estimated using a scenario-based analysis that estimated the fair value of the convertible promissory notes based on the probability-weighted present value of expected future investment returns, considering possible outcomes available to the noteholders, including conversions in subsequent equity financings, change of control transactions, settlement and dissolution. The fair value of the convertible promissory notes issued in May 2019 is estimated using a scenario-based analysis that estimates the fair value of the convertible promissory notes based on the probability-weighted present value of expected future investment returns, considering each of the possible outcomes available to the noteholders, including various initial public offering, settlement, equity financing, corporate transaction and dissolution scenarios.

## Results of Operations

### *Comparison of the Six Months Ended June 30, 2018 and 2019*

The following table summarizes our results of operations for each of the periods indicated (in thousands):

| | Six Months Ended June 30, | | |
|---|---|---|---|
| | 2018 | 2019 (unaudited) | Change |
| Operating expenses: | | | |
| Research and development | $ – | $ 3,201 | $ 3,201 |
| In-process research and development | – | 78,897 | 78,897 |
| General and administrative | 506 | 2,142 | 1,636 |
| Total operating expenses | 506 | 84,240 | 83,734 |
| Loss from operations | (506) | (84,240) | (83,734) |
| Other income (expense): | | | |
| Interest income | – | 101 | 101 |
| Interest expense | (4) | (1,148) | (1,144) |
| Change in fair value of warrant liabilities | – | (1,284) | (1,284) |
| Change in fair value of convertible promissory notes | (4) | (2,442) | (2,438) |
| Total other income (expense) | (8) | (4,773) | (4,765) |
| Net loss | $ (514) | $ (89,013) | $ (88,499) |

***Research and Development Expenses.*** We had no research and development expenses for the six months ended June 30, 2018 as we had not yet identified or in-licensed a product candidate. The $3.2 million of research and development expenses for the six months ended June 30, 2019 consisted of $3.0 million of clinical development of vonoprazan and $0.2 million of personnel-related expenses.

***In-Process Research and Development Expenses.*** We had no in-process research and development expenses for the six months ended June 30, 2018. The $78.9 million of in-process research and development expenses for the six months ended June 30, 2019 consisted of the purchase price for the research and development assets we acquired as part of the Takeda License.

***General and Administrative Expenses.*** General and administrative expenses were $0.5 million and $2.1 million for the six months ended June 30, 2018 and 2019, respectively. The increase of $1.6 million was due to increases of $0.6 million in legal fees related to corporate and intellectual property matters, $0.4 million in professional services expenses for accounting, audit, tax, valuation and other services, $0.3 million in personnel-related expenses, $0.2 million of consulting services expenses, and $0.1 million of other operating expenses.

***Other Income (Expense).*** Other expense of $8,000 for the six months ended June 30, 2018 consisted of $4,000 of interest expense on our outstanding convertible promissory notes and $4,000 of other expense related to the increase in fair value of those convertible promissory notes. Other expense of $4.8 million for the six months ended June 30, 2019 consisted of $2.4 million of other expense related to the increase in the fair value of our convertible promissory notes, $1.3 million of other expense related to the increase in the fair value of warrant liabilities, $0.9 million of interest expense on our outstanding convertible promissory notes, $0.3 million of interest expense on outstanding commercial bank debt, and partially offset by $0.1 million of interest income.

**Liquidity and Capital Resources**

We have incurred net losses and negative cash flows from operations since our inception and anticipate we will continue to incur net losses for the foreseeable future. As of June 30, 2019, we had cash and cash equivalents of $82.9 million.

***Commercial Bank Debt***

On May 14, 2019, we entered into the Loan Agreement with SVB, as administrative and collateral agent, and lenders SVB and WestRiver. We borrowed $25.0 million, or Term Loan A, at the inception of the Loan Agreement and have the right to borrow an additional $25.0 million, or Term Loan B, and which we collectively refer to as the Term Loans. Term Loan B is available through March 31, 2020, provided that (i) we have received at least $150.0 million of net cash proceeds in connection with the issuance and sale, subsequent to April 1, 2019, of our equity securities and subordinated debt, (ii) we have initiated Phase 3 clinical trials for vonoprazan, and (iii) no event of default has occurred. As of June 30, 2019, we had outstanding Term Loans of $25.0 million and accrued interest of $0.2 million.

The Term Loans bear interest at a floating rate of the higher of the Wall Street Journal Prime rate plus 1.75% (7.25% at June 30, 2019) or 7.25%. The monthly payments consist of interest-only through June 1, 2021 or, in the event of positive data with respect to our Phase 3 clinical trials in both indications for vonoprazan sufficient to file an NDA with the FDA, through June 1, 2022. Subsequent to the interest-only period, the Term Loans will be payable in equal monthly installments of principal, plus accrued and unpaid interest through the maturity date of May 1, 2024. In addition, we are obligated to pay a final payment fee of 8.25% of the original principal amount of the Term Loans. We may elect to prepay all or a portion of the Term Loans prior to maturity, subject to a prepayment fee of up to 2.0% of the then outstanding principal balance and payment of a pro rata portion of the final payment fee. After repayment, no Term Loan amounts may be borrowed again. The borrowings under the Loan Agreement are collateralized by substantially all of our assets, excluding intellectual property and certain other assets. We have agreed not to encumber our intellectual property assets without SVB's prior written consent unless a security interest in the underlying intellectual property is necessary to have a security interest in the accounts and proceeds that are part of the assets securing the Term Loans, in which case our intellectual property will automatically be included within the assets securing the Term Loans.

The Loan Agreement contains certain customary affirmative and negative covenants and events of default. The affirmative covenants include, among others, covenants requiring us to maintain our legal existence and governmental approvals, deliver certain financial reports, maintain insurance coverage and satisfy certain requirements regarding our operating accounts. The negative covenants include, among others, limitations on our ability to incur additional indebtedness and liens, merge with other companies or consummate certain changes of control, acquire other companies, engage in new lines of business, make certain investments, pay dividends, transfer or dispose of assets, amend certain material agreements or enter into various specified transactions. Upon the occurrence of an event of default, subject to any specified cure periods, all amounts owed by us would begin to bear interest at a rate that is 4.00% above the rate effective immediately before the event of default and may be declared immediately due and payable by SVB, as collateral agent. As of June 30, 2019, we were in compliance with all applicable covenants under the Loan Agreement.

In connection with the Loan Agreement, we issued the Lender Warrants, which become exercisable only if we borrow Term Loan B, and the number, class and per share exercise price of the shares subject to the warrants is dependent on the terms of certain future equity financing transactions of the Company, including an initial public offering. The Lender Warrants expire ten years from the date of issuance, subject to earlier termination on September 30, 2020 if we do not draw down Term Loan B

on or before March 31, 2020. The Lender Warrants include a put option pursuant to which, in the event that we do not draw down Term Loan B on or before March 31, 2020, the warrant holders may require us to repurchase the warrants for a total aggregate repurchase price of $0.5 million. The put right is exercisable through September 30, 2020.

***Convertible Note Financings***

From January 2018 to April 2019, we issued an aggregate of $2.4 million of convertible promissory notes to Frazier, or the Frazier Notes, bearing interest at per annum rates ranging from 1.68% to 2.55%. In May 2019, these notes and related accrued interest were exchanged, at their then fair value of $2.4 million, for the May 2019 convertible promissory notes described below.

On May 7, 2019, we entered into a note purchase agreement under which we issued an aggregate of $90.3 million of unsecured convertible promissory notes, or the May 2019 Notes, resulting in gross proceeds to us of $87.8 million in cash and $2.4 million related to the exchange of the Frazier Notes. Including the conversion of the Frazier Notes, Frazier purchased $20.0 million of the May 2019 Notes. The May 2019 Notes bear interest at a rate of 6% per annum and are subordinated to borrowings under our Loan Agreement. The May 2019 Notes become payable upon demand of the holders of at least 60% of the outstanding principal amount of the May 2019 Notes, including Frazier, on May 7, 2020, or the Maturity Date, and become due and payable on May 7, 2022, subject to earlier conversion or repayment in the event we complete certain equity financings or a change of control. The note purchase agreement includes certain customary covenants and events of default. The May 2019 Notes will automatically convert into shares of our common stock immediately prior to the completion of this offering.

***Funding Requirements***

Based on our current operating plan, we believe that our existing cash and cash equivalents, together with the estimated net proceeds from this offering, will be sufficient to meet our anticipated cash requirements through at least the next 24 months. In particular, we expect the net proceeds from this offering will allow us to complete our planned Phase 3 clinical trials of vonoprazan in the treatment of erosive esophagitis and *H. pylori* infection. However, our forecast of the period of time through which our financial resources will be adequate to support our operations is a forward-looking statement that involves risks and uncertainties, and actual results could vary materially. We have based this estimate on assumptions that may prove to be wrong, and we could deplete our capital resources sooner than we expect. Additionally, the process of testing product candidates in clinical trials is costly, and the timing of progress and expenses in these trials is uncertain.

Our future capital requirements will depend on many factors, including:

- the initiation, type, number, scope, results, costs and timing of, our clinical trials of vonoprazan, and preclinical studies or clinical trials of other potential product candidates we may choose to pursue in the future, including feedback received from regulatory authorities;
- the costs and timing of manufacturing for vonoprazan or any future product candidates, including commercial scale manufacturing if any product candidate is approved;
- the costs, timing and outcome of regulatory review of vonoprazan or any future product candidates;
- the costs of obtaining, maintaining and enforcing our patents and other intellectual property rights;
- our efforts to enhance operational systems and hire additional personnel to satisfy our obligations as a public company, including enhanced internal controls over financial reporting;

- the costs associated with hiring additional personnel and consultants as our business grows, including additional executive officers and clinical development personnel;
- the timing and amount of the milestone or other payments we must make to Takeda and any future licensors;
- the costs and timing of establishing or securing sales and marketing capabilities if vonoprazan or any future product candidate is approved;
- our ability to achieve sufficient market acceptance, coverage and adequate reimbursement from third-party payors and adequate market share and revenue for any approved products;
- patients' willingness to pay out-of-pocket for any approved products in the absence of coverage and/or adequate reimbursement from third-party payors;
- the terms and timing of establishing and maintaining collaborations, licenses and other similar arrangements; and
- costs associated with any products or technologies that we may in-license or acquire.

Until such time, if ever, as we can generate substantial product revenues to support our cost structure, we expect to finance our cash needs through equity offerings, the Loan Agreement, debt financings, or other capital sources, including potential collaborations, licenses and other similar arrangements. To the extent that we raise additional capital through the sale of equity or convertible debt securities, the ownership interest of our stockholders will be or could be diluted, and the terms of these securities may include liquidation or other preferences that adversely affect the rights of our common stockholders. Debt financing and equity financing, if available, may involve agreements that include covenants limiting or restricting our ability to take specific actions, such as incurring additional debt, making capital expenditures or declaring dividends. If we raise funds through collaborations, or other similar arrangements with third parties, we may have to relinquish valuable rights to our technologies, future revenue streams, research programs or product candidates or grant licenses on terms that may not be favorable to us and/or may reduce the value of our common stock. If we are unable to raise additional funds through equity or debt financings when needed, we may be required to delay, limit, reduce or terminate our product development or future commercialization efforts or grant rights to develop and market our product candidates even if we would otherwise prefer to develop and market such product candidates ourselves. We have prepared cash flow forecasts which indicate that based on our expected operating losses and negative cash flows, there is substantial doubt about our ability to continue as a going concern without raising additional capital within 12 months after the date that the combined financial statements for the year ended December 31, 2018 and for the six months ended June 30, 2019 are issued. Our independent registered public accounting firm also included an explanatory paragraph in its report on our combined financial statements as of and for the year ended December 31, 2018 indicating that there is substantial doubt about our ability to continue as a going concern.

***Cash Flows***

The following table sets forth a summary of the net cash flow activity for each of the periods indicated (in thousands):

| | Year Ended December 31, 2018 | Six Months Ended June 30, 2018 | Six Months Ended June 30, 2019 |
|---|---|---|---|
| | | (unaudited) | |
| Net cash provided by (used in): | | | |
| Operating activities | $ (1,023) | $ (452) | $ (6,018) |
| Investing activities | – | – | (25,118) |
| Financing activities | 1,902 | 552 | 113,174 |
| Net increase in cash | $ 879 | $ 100 | $ 82,038 |

***Operating Activities***

Net cash used in operating activities was approximately $1.0 million for the year ended December 31, 2018, and $0.5 million and $6.0 million for the six months ended June 30, 2018 and 2019, respectively. The net cash used in operating activities for the year ended December 31, 2018 and the six months ended June 30, 2018 was primarily due to our net loss in each period. The net cash used in operating activities for the six months ended June 30, 2019 was due to our net loss of $89.0 million, adjusted for $82.7 million of noncash charges and a $0.3 million net change in operating assets and liabilities. Noncash charges consisted of our in-process research and development charges of $78.9 million related to the Takeda License, $2.4 million related to the change in fair value of convertible promissory notes, $1.3 million related to the change in fair value of warrant liabilities, and $0.1 million of amortization of debt discounts on our commercial bank debt. The net change in operating assets and liabilities related to a $1.0 million increase in accrued interest on our outstanding convertible promissory notes and commercial bank debt and a $0.9 million increase in accounts payable and accrued expenses in support of the growth in our operating activities, partially offset by a $1.6 million increase in prepaid clinical activities.

***Investing Activities***

Net cash used in investing activities for the six months ended June 30, 2019 was primarily due to the cash we paid, including transaction costs, to acquire the Takeda License. We had no investing activities for the year ended December 31, 2018.

***Financing Activities***

Net cash provided by financing activities for the year ended December 31, 2018 and the six months ended June 30, 2018 was primarily due to proceeds from our issuance of convertible promissory notes. Net cash provided by financing activities for the six months ended June 30, 2019 was $113.2 million, due to $88.3 million of net proceeds from our issuance of convertible promissory notes and $24.9 million of net proceeds from our commercial bank debt.

### Contractual Obligations and Commitments

The following table summarizes our contractual obligations as of June 30, 2019 (in thousands):

| | Payments Due by Period | | | | |
|---|---|---|---|---|---|
| | Total | Less than 1 Year | 1-3 Years | 3-5 Years | More than 5 Years |
| Long-term debt, including interest and final payment fee[1] | $ 33,425 | $ 1,843 | $12,372 | $19,210 | $ – |
| Convertible promissory notes, including interest[2] | 95,680 | 95,680 | – | – | – |
| Total | $129,105 | $97,523 | $12,372 | $19,210 | $ – |

(1) Our outstanding long-term debt bears interest at a variable rate. The interest amounts included herein are based on the interest rate in effect as of June 30, 2019.
(2) Our outstanding convertible promissory notes become payable upon demand of the holders of at least 60% of the outstanding principal amount of the notes on May 7, 2020, and become due and payable on May 7, 2022, subject to earlier conversion or repayment in the event we complete certain equity financings or a change of control. The amounts herein assume repayment on May 7, 2020.

Under the Takeda License, we have milestone payment obligations that are contingent upon the achievement of specified levels of product sales and are required to make certain royalty payments in connection with the sale of products developed under the agreement. As of June 30, 2019, we are unable to estimate the timing or likelihood of achieving the milestones or making future product sales and, therefore, any related payments are not included in the table above.

We enter into contracts in the normal course of business for contract research services, contract manufacturing services, professional services and other services and products for operating purposes. These contracts generally provide for termination after a notice period, and, therefore, are cancelable contracts and not included in the table above.

### Critical Accounting Policies and Significant Judgments and Estimates

Our management's discussion and analysis of our financial condition and results of operations is based on our combined financial statements, which have been prepared in accordance with generally accepted accounting principles in the United States, or GAAP. The preparation of our combined financial statements requires us to make estimates and assumptions that affect the reported amounts of assets, liabilities and expenses and the disclosure of contingent assets and liabilities in our combined financial statements and accompanying notes. We evaluate these estimates and judgments on an ongoing basis. We base our estimates on historical experience and on various other factors that we believe are reasonable under the circumstances, the results of which form the basis for making judgments about the carrying value of assets and liabilities that are not readily apparent from other sources. Actual results may differ from these estimates under different assumptions or conditions.

While our significant accounting policies are more fully described in Note 1 to our combined financial statements included elsewhere in this prospectus, we believe that the following accounting policies are the most critical for fully understanding and evaluating our financial condition and results of operations.

#### *Accrued Research and Development Expenses*

As part of the process of preparing our combined financial statements, we are required to estimate our accrued expenses as of each balance sheet date. This process involves reviewing open

contracts and purchase orders, communicating with our personnel to identify services that have been performed on our behalf and estimating the level of service performed and the associated cost incurred for the service when we have not yet been invoiced or otherwise notified of the actual cost. We make estimates of our accrued expenses as of each balance sheet date based on facts and circumstances known to us at that time. We periodically confirm the accuracy of our estimates with the service providers and make adjustments, if necessary. The significant estimates in our accrued research and development expenses include the costs incurred for services performed by our vendors in connection with research and development activities for which we have not yet been invoiced.

We base our expenses related to research and development activities on our estimates of the services received and efforts expended pursuant to quotes and contracts with vendors that conduct research and development on our behalf. The financial terms of these agreements are subject to negotiation, vary from contract to contract and may result in uneven payment flows. There may be instances in which payments made to our vendors will exceed the level of services provided and result in a prepayment of the research and development expense. In accruing service fees, we estimate the time period over which services will be performed and the level of effort to be expended in each period. If the actual timing of the performance of services or the level of effort varies from our estimate, we adjust the accrual or prepaid expense accordingly. Advance payments for goods and services that will be used in future research and development activities are expensed when the activity has been performed or when the goods have been received rather than when the payment is made.

Although we do not expect our estimates to be materially different from amounts actually incurred, if our estimates of the status and timing of services performed differ from the actual status and timing of services performed, it could result in us reporting amounts that are too high or too low in any particular period. To date, there have been no material differences between our estimates of such expenses and the amounts actually incurred.

***In-Process Research and Development***

We evaluate whether acquired intangible assets are a business under applicable accounting standards. Additionally, we evaluate whether the acquired assets have a future alternative use. Intangible assets that do not have future alternative use, such as the Takeda License, are considered acquired in-process research and development. When the acquired in-process research and development assets are not part of a business combination, the value of the consideration paid is expensed on the acquisition date. Future costs to develop these assets are recorded to research and development expense as they are incurred.

***Fair Value of Warrant Liabilities and Convertible Promissory Notes***

As described above, our warrant liabilities and convertible promissory notes are revalued at each reporting period with changes in the fair value of the liabilities recorded as a component of other income (expense) in the combined statements of operations. There are significant judgments and estimates inherent in the determination of the fair value of these liabilities. If we had made different assumptions including, among others, those related to the timing and probability of various corporate scenarios, discount rates, volatilities and exit valuations, the carrying values of our warrant liabilities and convertible promissory notes, and our net loss and net loss per common share could have been significantly different.

***Stock-Based Compensation Expense***

Stock-based compensation expense represents the cost of the grant date fair value of equity awards recognized over the requisite service period of the awards (generally the vesting period) on a

straight-line basis with forfeitures recognized as they occur. Through June 30, 2019, our stock-based compensation expense primarily consisted of our issuance of restricted stock awards, or RSAs, for which the fair value is determined based on the fair value of the underlying common stock. As of June 30, 2019, the unrecognized stock-based compensation expense was $59,000, which is expected to be recognized as expense over a weighted-average period of approximately 0.7 years.

***Common Stock Valuations***

Prior to obtaining the Takeda License in May 2019 and entering into the May 2019 Notes, the fair value of our common stock was nominal because we were not sufficiently capitalized and held no assets that could be used to generate future revenues. Subsequent to obtaining the Takeda License and entering into the May 2019 Notes, we estimated the fair value of our common stock using methodologies, approaches and assumptions consistent with the American Institute of Certified Public Accountants Accounting and Valuation Guide: *Valuation of Privately Held Company Equity Securities Issued as Compensation*, or the Practice Aid. The Practice Aid prescribes several valuation approaches for setting the value of an enterprise, such as the cost, income and market approaches, and various methodologies for allocating the value of an enterprise to its common stock. We utilized a scenario-based analysis that estimated the fair value per share based on the probability-weighted present value of expected future investment returns, considering each of the possible outcomes available to us, including various initial public offering, stay private and dissolution scenarios, and applying a discount for lack of marketability. We considered various stay private scenarios using the income approach and allocated the indicated equity value to each class of equity based on the current-value method. We also considered various initial public offering scenarios based on expected equity values in an initial public offering and allocated the indicated equity value to each class of equity on a fully-diluted basis considering the dilutive impacts of the May 2019 Notes and the Lender Warrants.

We considered various objective and subjective factors to determine the fair value of our common stock, including:

- valuations of our common stock performed with the assistance of independent third-party valuation specialists;
- our stage of development and business strategy, including the status of research and development efforts of vonoprazan, and the material risks related to our business and industry;
- our results of operations and financial position, including our levels of available capital resources;
- the valuation of publicly-traded companies in the life sciences and biotechnology sectors;
- the lack of marketability of our common stock as a private company;
- the likelihood of achieving a liquidity event for the holders of our common stock, such as an initial public offering or a sale of our company, given prevailing market conditions;
- trends and developments in our industry; and
- external market conditions affecting the life sciences and biotechnology industry sectors.

There are significant judgments and estimates inherent in the determination of the fair value of our common stock. These judgments and estimates include assumptions regarding our future operating performance, the time to complete an initial public offering or other liquidity event and the determination of the appropriate valuation methods. If we had made different assumptions, our net loss and net loss per common share could have been significantly different.

Following the completion of this offering, the fair value of our common stock will be based on the closing price as reported on the date of grant on the primary stock exchange on which our common stock is traded.

### JOBS Act

As an emerging growth company under the JOBS Act, we can take advantage of an extended transition period for complying with new or revised accounting standards. This allows an emerging growth company to delay the adoption of certain accounting standards until those standards would otherwise apply to private companies. We have irrevocably elected not to avail ourselves of this exemption and, therefore, we will be subject to the same new or revised accounting standards as other public companies that are not emerging growth companies. We intend to rely on other exemptions provided by the JOBS Act, including without limitation, not being required to comply with the auditor attestation requirements of Section 404(b) of Sarbanes-Oxley.

We will remain an emerging growth company until the earliest of (i) the last day of the fiscal year following the fifth anniversary of the consummation of this offering, (ii) the last day of the fiscal year in which we have total annual gross revenue of at least $1.07 billion, (iii) the last day of the fiscal year in which we are deemed to be a “large accelerated filer” as defined in Rule 12b-2 under the Exchange Act, which would occur if the market value of our common stock held by non-affiliates exceeded $700.0 million as of the last business day of the second fiscal quarter of such year, or (iv) the date on which we have issued more than $1.0 billion in non-convertible debt securities during the prior three-year period.

### Recent Accounting Pronouncements

See Note 1 to our combined financial statements included elsewhere in this prospectus.

### Off-Balance Sheet Arrangements

During the periods presented we did not have, nor do we currently have, any off-balance sheet arrangements as defined under SEC rules.

### Quantitative and Qualitative Disclosures about Market Risk

#### *Interest Rate Risk*

Our cash and cash equivalents consist of cash in readily available checking accounts and money market funds. As a result, the fair value of our portfolio is relatively insensitive to interest rate changes. Our outstanding convertible promissory notes bear interest at a fixed rate. Our long-term debt bears interest at a variable rate. A 10% increase or decrease in the interest rate on our long-term debt would not have a material effect on our financial position, results of operations or cash flows.

#### *Effects of Inflation*

Inflation generally affects us by increasing our cost of labor and research and development contract costs. We do not believe inflation has had a material effect on our results of operations during the periods presented.

# BUSINESS

## Overview

We are a late clinical-stage biopharmaceutical company focused on developing and commercializing novel treatments for gastrointestinal, or GI, diseases. Our initial product candidate, vonoprazan, is an oral small molecule potassium competitive acid blocker, or P-CAB. P-CABs are a novel class of medicines that block acid secretion in the stomach. Vonoprazan has shown rapid, potent, and durable anti-secretory effects and has demonstrated clinical benefits over standard of care treatments as a single agent in the treatment of gastroesophageal reflux disease, or GERD, and in combination with antibiotics for the treatment of *Helicobacter pylori,* or *H. pylori,* infection. Takeda Pharmaceutical Company Limited, or Takeda, developed vonoprazan and has received marketing approval in nine countries in Asia and Latin America. Vonoprazan generated over $500 million in net sales in its fourth full year on the market since its approval in Japan in late 2014. In May 2019, we in-licensed the U.S., European, and Canadian rights to vonoprazan from Takeda. We intend to initiate two pivotal Phase 3 clinical trials of vonoprazan in the fourth quarter of 2019.

We believe we can leverage Takeda's extensive clinical data, including results from 17 Phase 3 clinical trials, to advance vonoprazan through pivotal trials in the United States and Europe. We plan to initiate two pivotal Phase 3 clinical trials in the fourth quarter of 2019 for vonoprazan: one for the treatment of erosive GERD, also known as erosive esophagitis, and a second for the treatment of *H. pylori* infection. We expect to report top-line data from both trials in 2021. We believe that the successful completion of our Phase 3 clinical trials, together with the existing clinical data, will support regulatory submissions in 2021 and 2022 for marketing approval for the treatment of *H. pylori* infection and erosive esophagitis, respectively. In August 2019, we received qualified infectious disease product, or QIDP, designation from the U.S. Food and Drug Administration, or FDA, for vonoprazan in combination with certain antibiotics for the treatment of *H. pylori* infection which provides, among other benefits, extension of any regulatory exclusivity and potential eligibility for priority review. Vonoprazan has the potential to be the first gastric anti-secretory agent from a novel class approved in the United States, Europe, or Canada in over 30 years.

GERD and *H. pylori* infection are two of the most common acid-related GI diseases and impact millions of people. The prevalence of GERD is estimated to be 20% of the U.S. population and 15% of the population in the five major countries in the European Union (France, Germany, Italy, Spain and the United Kingdom, or the EU5). GERD is a disease that develops when the reflux of acidic stomach contents causes troublesome symptoms and/or complications. Approximately 30% of GERD patients have erosive esophagitis. *H. pylori* is a bacterial pathogen that infects approximately 35% of the U.S. population and 45% of the EU5 population. As a result of the chronic inflammation induced by *H. pylori* infection, approximately 20% of infected patients will develop a range of pathologies, including dyspepsia, peptic ulcer disease, gastric cancer, and mucosa-associated lymphoid tissue (MALT) lymphoma.

Over the last thirty years, the proton pump inhibitor, or PPI, class, has been the standard of care for the treatment of acid-related GI diseases. PPIs are generally used as a single agent for the treatment of GERD and in combination with antibiotics for the treatment of *H. pylori* infection. The PPI class includes drugs such as Prilosec (omeprazole), Nexium (esomeprazole), and Prevacid (lansoprazole). Prior to the introduction of generic and over-the-counter, or OTC, alternatives, annual PPI class sales reached approximately $12.5 billion in the United States, and peak sales for individual brands were approximately $3.7 billion for Prilosec, $3.5 billion for Nexium, and $3.4 billion for Prevacid in the United States.

While PPIs are the current standard of care and have experienced significant commercial success, they have significant limitations that result in a large unmet medical need. In GERD, PPI

therapy is suboptimal for many patients due to the slow onset and insufficient duration of acid control which can lead to inadequate symptom relief. Approximately 15% to 45% of GERD patients remain inadequately treated with PPIs. In the treatment of *H. pylori* infection, the standard of care consists of a combination of a PPI and at least two oral antibiotics. However, increasing antibiotic resistance has resulted in declining eradication rates with PPI-based therapy. We believe these unmet medical needs are in part driven by limitations associated with the mechanism of action and pharmacokinetics of PPIs.

PPIs reduce gastric acid secretion by irreversibly binding to and inhibiting active proton pumps expressed on the parietal cells. PPIs require activation by gastric acid, but they are unstable in the presence of acid. This instability, combined with the short circulating half-life of PPIs, limits their efficacy. Additionally, because proton pumps continuously switch between active and inactive states, multiple doses of PPIs are required to inhibit enough proton pumps to achieve a clinical benefit. As a result, PPIs have a relatively slow onset of action and limited potency and duration of effect, which may result in patients experiencing only partial relief, increasing PPI dosage, and/or cycling through multiple PPIs seeking relief.

Vonoprazan has a differentiated mechanism of action from PPIs. Unlike PPIs, vonoprazan:

- does not require activation by gastric acid;
- is stable in the presence of acid;
- binds with a slow dissociation rate to both active and inactive proton pumps; and
- has a long plasma half-life that replenishes the drug at the site of action over the course of the day.

These factors have enabled vonoprazan to demonstrate more rapid and potent acid suppression versus the PPI esomeprazole in human subjects two hours after oral dosing and maintain target acid inhibition over a 24-hour period in a randomized, open-label, crossover clinical trial. In contrast, PPIs require three to five days to reach steady state acid suppression and do not reliably maintain target acid inhibition over a 24-hour period. In addition, vonoprazan demonstrated approximately 10-to-100-fold better acid control compared to esomeprazole.

We believe that vonoprazan's anti-secretory profile may demonstrate clinically meaningful advantages over PPIs, such as:

- faster, more complete, and more durable healing of erosive esophagitis;
- faster, more complete, and more durable control of GERD symptoms;
- higher *H. pylori* eradication rates in combination with antibiotics compared to standard of care triple therapy and the potential for antibiotic-sparing dual therapy; and
- more flexible dosing, including dosing independent of food and time of day, and the potential for rapid symptom relief through on-demand dosing.

Vonoprazan has demonstrated clinical advantages over PPIs in the treatment of erosive esophagitis and *H. pylori* infection in completed Phase 3 clinical trials conducted in Japan and other Asian countries.

***Erosive esophagitis.*** In two Phase 3 clinical trials conducted in Japan assessing vonoprazan versus the PPI lansoprazole in the healing and maintenance of healing of erosive esophagitis, vonoprazan met its primary endpoint in demonstrating non-inferiority to lansoprazole. In a post hoc analysis of the healing trial, vonoprazan demonstrated faster healing and a superior overall healing rate compared to lansoprazole in patients with more severe erosive esophagitis. After two weeks of

treatment, 88% of erosive esophagitis patients with more severe disease were healed after treatment with vonoprazan versus 64% with lansoprazole (p=0.0008). In the maintenance of healing trial, vonoprazan demonstrated lower recurrence rates of erosive esophagitis six months after treatment versus lansoprazole across all grades of severity of erosive esophagitis. Vonoprazan achieved a 2% recurrence rate compared to 17% for lansoprazole (p<0.0001).

***H. pylori.*** A Phase 3 clinical trial was conducted in Japan assessing vonoprazan in combination with the antibiotics amoxicillin and clarithromycin versus lansoprazole in combination with these same antibiotics in first line treatment of *H. pylori* infection. In this trial, the vonoprazan-based regimen met its primary endpoint in demonstrating a non-inferior eradication rate of 93% compared to 76% for lansoprazole-based regimen (p<0.0001) and was also superior in a post hoc analysis of this trial (p<0.0001). In patients who failed first line therapy, vonoprazan in combination with the antibiotics metronidazole and amoxicillin demonstrated a 98% eradication rate as second line therapy. A p-value is the probability that the reported result was achieved purely by chance, such that a p-value of less than or equal to 0.05 or 0.01 means that there is a 5.0% or 1.0% or less probability, respectively, that the difference between the control group and the treatment group is purely due to chance. A p-value of 0.05 or less typically represents a statistically significant result.

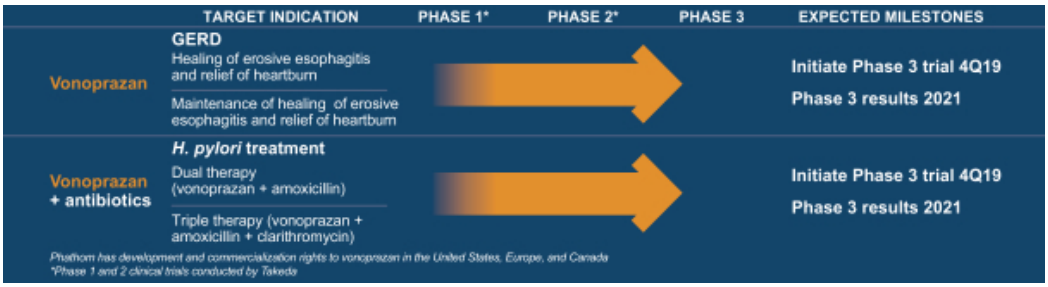
We have used this clinical experience to inform our planned Phase 3 clinical development program in these indications.

Our company was founded as a collaboration between Takeda and Frazier Healthcare Partners. Our founders and management team have deep expertise in developing GI therapeutics, including anti-secretory agents, and direct experience developing vonoprazan at Takeda. Our Chairman, Tadataka (Tachi) Yamada, M.D., is the former Chief Medical Officer and Chief Scientific Officer at Takeda. He is the former President of the American Gastroenterological Association and former Chief of Gastroenterology and Internal Medicine at the University of Michigan. Our Chief Executive Officer, David Socks, is the former Chief Executive Officer of Outpost Medicine, LLC, a GI and urology focused company. Mr. Socks was also President and Chief Operating Officer of Incline Therapeutics Inc. through its sale to the Medicines Company in 2013, and Senior Vice President, Corporate Development and Strategy of Cadence Pharmaceuticals, Inc. Azmi Nabulsi, M.D., M.P.H., our Chief Operating Officer, is the former Deputy Chief Medical and Scientific Officer at Takeda. Our Head of Regulatory, Tom Harris, is the former Senior Vice President and Head of Global Regulatory at Takeda. Dr. Yamada, Dr. Nabulsi, and Mr. Harris were extensively involved with the development of vonoprazan at Takeda. Our investors include Frazier Healthcare Partners, Medicxi, RA Capital Management, Abingworth, certain accounts managed by Janus Henderson Investors and BVF Partners LP.

As part of a planned transition, we expect that Terrie Curran, a member of our board of directors, will succeed Mr. Socks as Chief Executive Officer effective upon the closing of the acquisition of her current employer, Celgene Corporation, by Bristol-Myers Squibb Company. Ms. Curran has served as President, Global Inflammation and Immunology (I&I) Franchise and as a member of the Executive Committee at Celgene since 2017. Ms. Curran joined Celgene in 2013 as the U.S. Commercial Head of the I&I Franchise and built the capabilities and recruited the teams that executed the launch of OTEZLA. Following Ms. Curran's appointment as CEO, Mr. Socks will serve as interim Chief Financial Officer and continue to serve as a member of our board of directors.

**Our Pipeline**

The following chart summarizes our current development programs.




**Our Strategy**

Our goal is to be a leader in the development and commercialization of novel treatments for GI diseases. Our strategy is initially focused on developing and commercializing vonoprazan as a potential first-in-class P-CAB in the United States, Europe, and Canada for the treatment of acid-related GI diseases. Key elements of this strategy include:

- ***Advance the clinical development of vonoprazan in erosive esophagitis and H. pylori infection and seek marketing approval.*** We believe we can leverage the existing clinical data and post-marketing experience, as well as our management team's experience with vonoprazan, to advance vonoprazan through our planned pivotal Phase 3 clinical trials. We plan to initiate a single pivotal Phase 3 clinical trial of vonoprazan in each of erosive esophagitis and *H. pylori* infection beginning in the fourth quarter of 2019. We expect to report top-line data from both trials in 2021, and if successful, file regulatory submissions for marketing approval for the treatment of *H. pylori* infection in 2021 and for erosive esophagitis in 2022. If approved by the FDA as a new chemical entity, vonoprazan would receive a five-year period of marketing exclusivity within the United States and vonoprazan's QIDP designation would extend the U.S. marketing exclusivity for an additional five years.
- ***Commercialize vonoprazan in the United States.*** We plan to independently commercialize vonoprazan, if approved, in the United States by building a leading specialty gastroenterology commercial infrastructure to support the adoption of vonoprazan. We believe we can successfully launch vonoprazan in the United States with a focused specialty sales force targeting high prescribers of PPIs, particularly gastroenterologists. PPI prescribing is highly concentrated, with approximately 1.5% of U.S. PPI prescribers (approximately 12,000 total) accounting for approximately 20% of PPI prescriptions and approximately 6.0% of U.S. PPI prescribers (approximately 50,000 total) accounting for approximately 50% of PPI prescriptions, according to IQVIA. We believe we have an opportunity to achieve significant share of voice and exposure to physicians given the scarcity of actively marketed anti-secretory medicines. Given the limitations of PPIs and current unmet need, we believe the commercial opportunity for vonoprazan is substantial.
- ***Seek commercial partnerships to maximize the vonoprazan opportunity outside of the United States.*** We believe there is a significant commercial opportunity for vonoprazan in Europe and Canada. To address these markets, we plan to seek one or more partners with existing commercial infrastructure and expertise in these markets. We believe this strategy will allow us to realize the value of the market opportunity in Europe and Canada while focusing our resources on the U.S. market.

- ***Expand the development of vonoprazan across indications, dosing regimens, and alternative formulations and packaging***. We plan to pursue vonoprazan lifecycle extension strategies in areas with clear unmet need, clinical rationale, and commercial justification. These strategies may include: (i) additional indications, including treatment of gastric ulcers and duodenal ulcers, Barrett's esophagus, and eosinophilic esophagitis; (ii) flexible dosing regimens, such as on-demand therapy for symptom relief of GERD; and (iii) alternative formulations and packaging, such as orally disintegrating tablets and other oral dosage forms for patients with difficulty swallowing, an intravenous formulation for in-hospital applications, and pre-packaged convenience packs for the treatment of *H. pylori* infection. Additionally, we believe that vonoprazan has the ideal profile for an OTC product, including the potential for on-demand symptom relief and a well-tolerated safety profile.
- ***In-license or acquire additional clinical or commercial stage product candidates for the treatment of GI diseases in a capital efficient manner***. We intend to take advantage of our management team's GI expertise to opportunistically in-license or acquire additional innovative therapies for diseases treated by gastroenterologists. We plan to leverage our development and planned commercial infrastructure to support multiple assets targeting GI indications.

**Acid-Related GI Diseases**

***Overview***

Gastric acid is a digestive fluid formed in the stomach. The highly acidic environment of the stomach causes the unfolding, or denaturing, of food proteins that are subsequently broken down by gastric enzymes. Gastric acid is secreted by the hydrogen potassium ATPase enzyme, which is known as the proton pump. Proton pumps are expressed on the channeled surfaces, or canaliculi, of parietal cells in the stomach, which secrete acid. Proton pumps are continuously synthesized and switch between active and inactive states in response to various stimuli, such as food. When activated, proton pumps increase acid secretion.

GI diseases where treatment is related to acid control, such as GERD, peptic ulcer disease, Zollinger Ellison syndrome, and *H. pylori* infection, are significant medical problems because of their high prevalence, chronic nature and clinical sequelae. GERD results from the effects of acid on compromised mucosal defenses in the gastrointestinal tract. The reflux of gastric acid into the esophagus produces frequent and/or severe heartburn, indigestion, and reflux symptoms. Chronic GERD may damage esophageal tissue and progress to more severe diseases including erosive esophagitis, Barrett's esophagus, and esophageal cancer. GERD and related diseases are associated with impaired quality of life and substantial costs to the healthcare system given their chronic nature and sequelae. In *H. pylori* infection, gastric acid limits the effectiveness of antibiotics used to eradicate infection. Chronic *H. pylori* infection can lead to dyspepsia, peptic ulcer disease, gastric cancer, and mucosa-associated lymphoid tissue (MALT) lymphoma.

***Prevalence***

The prevalence of GI diseases is high. Approximately 20% to 40% of Western adults report chronic heartburn or regurgitation symptoms potentially related to GERD. We estimate that there are approximately 65 million individuals in the United States and 50 million individuals in the EU5 with GERD. In the United States, GERD is the most common gastroenterology-related outpatient diagnosis. Additionally, approximately 35% of the U.S. population and 45% of the EU5 population are infected with *H. pylori*. We estimate that there are approximately 115 million individuals in the United States and 145 million individuals in the EU5 infected with *H. pylori*.

**Prevalence of GERD and *H. pylori* Infection**

| | GERD | | *H. pylori* Infection | |
|---|---|---|---|---|
| | Prevalence | Estimated Population | Prevalence | Estimated Population |
| United States | 20% | 65 million | 35% | 115 million |
| EU5 | 15% | 50 million | 45% | 145 million |

***Treatments***

Treatments of acid-related GI diseases aim to provide relief of acute symptoms, healing of damaged tissue, and prevention of long-term clinical sequelae associated with chronic acid exposure. Gastric acidity is measured by the pH scale, a logarithmic scale where 7.0 describes a neutral state and lower levels indicate a higher level of acidity. The pH of the stomach typically ranges from 1.5 to 3.5. In patients with acid-related GI diseases, increasing gastric pH has been shown to improve mucosal healing rates and provide more rapid symptom relief for patients. For example, the duration of time that intra-gastric acidity is greater than pH 3.0 correlates with the healing of duodenal and gastric ulcers, and pH greater than 4.0 is correlated with the healing of erosive esophagitis. Similarly, in patients with *H. pylori* infection, a more neutral gastric pH of 5.0 to 7.6 preserves antibiotic function and is optimal for successful eradication.

Drug-induced gastric acid suppression is a key component of the management of acid-related GI diseases. Three classes of drugs with distinct mechanisms of action are principally used for treatment in the United States and Europe: antacids, histamine receptor antagonists, or H2RAs, and PPIs.

*Antacids*

Antacids, first commercially available in the 1930s, directly neutralize gastric acid to raise intra-gastric pH and can alleviate intermittent, mild symptoms of acid-related GI diseases, such as heartburn, but they are only effective for a short duration and require frequent administrations per day. In addition, antacids do not significantly help heal or prevent complications of acid-related diseases. Antacids include commonly-known OTC products, such as Alka-Seltzer, Pepto-Bismol, Rolaids, and TUMS.

*Histamine Receptor Antagonists (H2RAs)*

H2RAs, first commercially available in the 1970s, decrease gastric acid secretion in order to raise gastric pH. H2RAs represented a dramatic improvement over antacids in the control of gastric acid and consequently in the management of acid-related GI diseases. H2RAs are also generally safe and well-tolerated. Among the H2RA class were the first commercial blockbuster drugs, Pepcid (famotidine), Tagamet (cimetidine), and Zantac (ranitidine). Zantac was the world's highest-selling prescription drug

in the mid-1990s, with global sales of $3.7 billion and U.S. sales of $2.2 billion. Prior to the launch of generic H2RAs and increasing competition from PPIs, the H2RA class achieved sales of approximately $3.5 billion in the United States. H2RAs achieved commercial success despite clinical limitations, including unreliable 24-hour acid control, poor control of post-meal symptoms, and loss of efficacy over time.

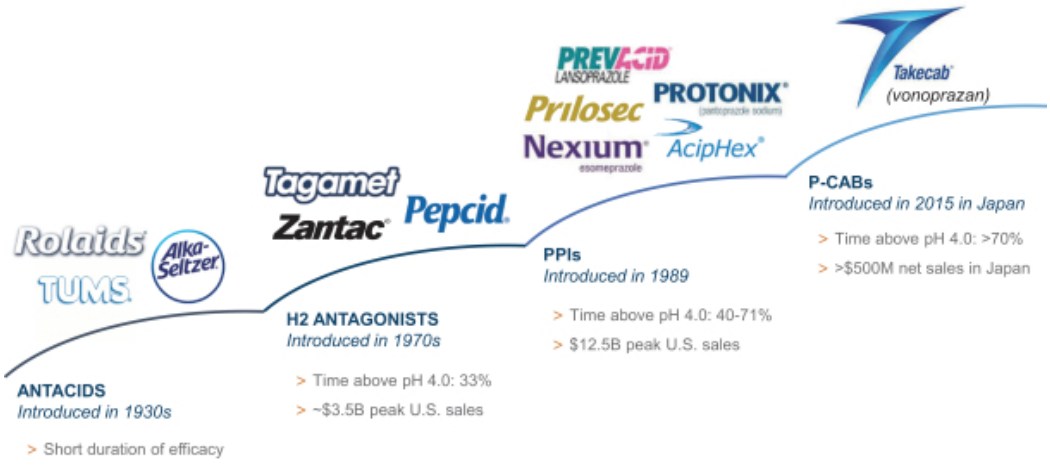
*Proton Pump Inhibitors (PPIs)*

PPIs, first commercially available in 1989, offered improved acid control over H2RAs. Pharmacodynamic data demonstrated that PPIs maintain gastric pH above target levels for a longer duration than H2RAs. A commonly used benchmark of anti-secretory activity is the percentage of time in a 24-hour period that gastric pH exceeds 4.0, which we refer to as time above pH 4.0, which ranges from 40% to 71% for PPIs versus 33% for H2RAs.

Given this improved pharmacodynamic profile, PPIs demonstrated improved clinical symptom relief and healing over H2RAs. In a meta-analysis of results from 33 randomized clinical trials with over 3,000 GERD patients, a reduction in symptoms was achieved in 83% of patients taking PPIs versus 60% of those on H2RAs. In a second meta-analysis, the eight-week healing rate in patients with erosive esophagitis was 82% for PPIs versus 52% for H2RAs.

The PPI class is currently the first-line treatment of acid-related GI diseases. Prior to the introduction and adoption of generic and OTC alternatives, annual PPI class sales reached approximately $12.5 billion in the United States, and peak sales for individual brands were approximately $3.7 billion for Prilosec, $3.5 billion for Nexium, and $3.4 billion for Prevacid. As recently as 2015, the last branded PPI, Dexilant (dexlansoprazole), reached approximately $530 million in sales in the United States despite limited differentiation from other PPIs. While Dexilant demonstrated a modest improvement in time above pH 4.0 compared to other PPIs, the approved dose did not demonstrate consistent superiority in Phase 3 trials against other PPIs on the healing of erosive esophagitis and has not been tested against PPIs in other indications. We believe that the commercial success of Dexilant highlights the value to physicians and patients of even incremental improvements over other PPIs.

**History of Pharmaceutical Agents for Control of Gastric Acid**



PPI Limitations

While PPIs provide clinically meaningful symptom relief and healing for millions of patients suffering from acid-related GI diseases, they are inadequate for many patients. The suboptimal anti-secretory profile of PPIs results in slow onset of symptom relief, breakthrough nighttime or postprandial heartburn, and treatment failure. Approximately 15% to 45% of GERD patients are inadequately treated with PPIs, experiencing persistent, troublesome symptoms, such as heartburn and regurgitation. In approximately two thirds of symptomatic GERD patients, reflux symptoms are not adequately controlled after the first dose of a PPI, and nearly 50% of patients still suffer from symptoms three days later. Given these limitations, more than 20% of GERD patients on PPI therapy take their PPI twice daily, which is not FDA approved, or purchase OTC heartburn treatments in addition to their prescription medicine. In a survey of approximately 1,000 GERD patients and 1,000 physicians, approximately one third of GERD patients reported persistent symptoms and were dissatisfied with PPI therapy and 35% of physicians perceived patients as somewhat satisfied to completely dissatisfied with PPI treatment. In addition, in July 2019 we conducted a U.S. market research study of 100 gastroenterologists and 100 primary care physicians who commonly prescribe PPIs and treat patients with GERD and *H. pylori* infection. Surveyed physicians reported that approximately 25% of patients are not satisfied on PPIs.

In patients with more severe grades of erosive esophagitis, studies with PPIs have reported failure rates of healing of esophageal erosions exceeding 25%. Additionally, recurrence of erosions is common in healed erosive esophagitis patients receiving maintenance PPI therapy. One study reported recurrence in 15% to 23% of patients with less severe erosive esophagitis and 24% to 41% of patients with more severe erosive esophagitis. We believe that these limitations of PPIs are in part driven by their mechanism of action and pharmacokinetics.

**Mechanistic Differences Between PPIs and Vonoprazan**

***PPIs***

After oral dosing, PPIs reach the gastric parietal cells through the bloodstream. PPIs are prodrugs that are converted to their active form in the acidic environment of the secretory canaliculus of the parietal cell but degrade quickly because their active form is unstable in acid. For example, the half-life of omeprazole (Prilosec) is less than 10 minutes at pH 2.0. The active form of a PPI blocks acid production by covalently binding to active proton pumps that have moved to the surface of the secretory canaliculi after activation of the parietal cell with stimuli, such as a meal. Because PPIs bind only to actively secreting pumps, it is generally recommended that they be administered 30 to 60 minutes before a meal to achieve maximal efficacy. Once covalently bound to the proton pumps, the active PPI molecule is no longer available to bind to newly synthesized or activated proton pumps. Furthermore, given the relatively short plasma half-life of most PPIs of one to two hours, resupply of additional PPI molecules from the bloodstream is limited, and newly activated pumps are not inhibited. Due to this profile, PPI dosing over several days is required to inhibit enough proton pumps to increase gastric pH to a clinically meaningful threshold, and PPIs have a limited window of efficacy leading to incomplete acid suppression over the 24-hour dosing interval. In addition, PPIs are primarily metabolized by CYP2C19, an enzyme which has significant interpatient metabolic variability based on genotype. As a result, PPI exposure levels in some patients may not achieve target levels, potentially reducing clinical efficacy.

***Vonoprazan***

Vonoprazan has a differentiated mechanism of action from PPIs. When vonoprazan reaches gastric parietal cells from the bloodstream, it accumulates in the secretory canaliculus where the proton pumps are present in their active state. In contrast to most PPIs, vonoprazan does not require gastric acid for activation, is stable in the presence of gastric acid, reversibly binds to proton pumps in both

their inactive and active states, and remains in the secretory canaliculus where it continues to inhibit acid secretion over an extended period. Vonoprazan's prolonged effect is also maintained through a slow dissociation rate from the proton pumps and resupply from the bloodstream due to its seven-hour half-life. These characteristics allow vonoprazan to rapidly achieve target 24-hour acid suppression within two hours of a single dose, unlike PPIs that require three to five days to achieve stable acid suppression. In addition, vonoprazan is primarily metabolized by CYP3A4/5, an enzyme which has less genetic variability than CYP2C19, and may exhibit more consistent activity than PPIs across U.S. and European populations.

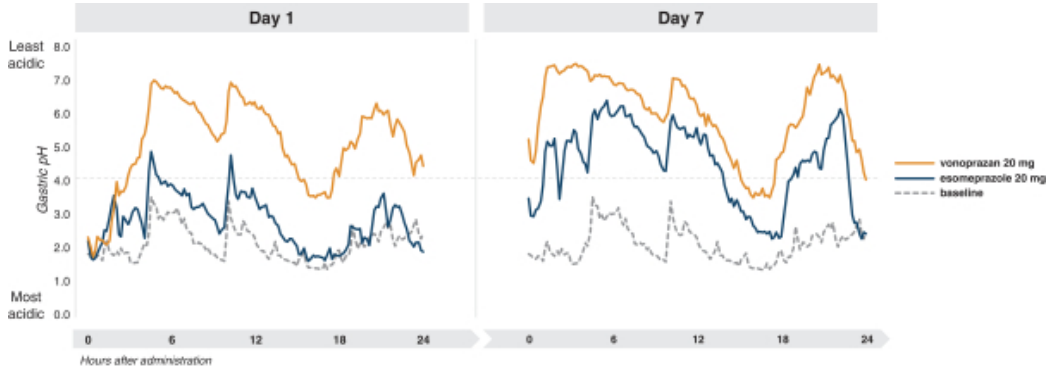
The mechanistic and pharmacologic differences of PPIs and vonoprazan are summarized in the table below.

| | PPIs | Vonoprazan |
|---|---|---|
| Activation and stability | Prodrugs that require acid for activation yet are unstable in acidic conditions | No activation required and stable in acidic conditions |
| Binding to proton pump | Irreversibly blocks active proton pumps | Reversibly blocks both active and inactive proton pumps with slow dissociation |
| Half-life | < 2 hours | ~7 hours |
| Onset of action | Steady state anti-secretory effect and complete symptom relief is not achieved for 3 to 5 days (~40% of pumps blocked after a single PPI dose) | Achieved target 24-hour acid suppression within 2 hours of a single dose in a clinical trial in healthy volunteers comparing vonoprazan and esomeprazole |
| Dosing restrictions | Generally administered 30 to 60 minutes before a meal | Dosing independent of meal |
| Inter-patient variability | Metabolism via CYP2C19 | Metabolism via CYP3A4/5 |

**Vonoprazan Pharmacodynamics vs. PPIs**

Vonoprazan's more rapid, potent, and durable anti-secretory effects versus the PPI esomeprazole (Nexium) were demonstrated in a randomized, open-label, crossover clinical trial comparing 20 mg of once daily, or QD, vonoprazan to 20 mg QD of esomeprazole in 20 healthy volunteers. As shown below, vonoprazan achieved rapid and potent pH control on Day 1 relative to esomeprazole (left). Vonoprazan maintained pH approximately 1 to 2 units higher than esomeprazole at Day 7 (right), which represents a 10-to-100-fold reduction in acidity.

**Improved Onset and Potency of pH Control of Vonoprazan vs. Esomeprazole at Day 1 and Day 7**




This improved potency and duration of pH control with vonoprazan, as measured by time above pH 4.0, was evident not only at Day 1, but also at Day 7 when esomeprazole had reached its steady-state (see table below).

**Improved Time Above pH 4.0 of Vonoprazan vs. Esomeprazole at Day 1 and Day 7**

| | Time Above pH 4.0 (%) | | |
|---|---|---|---|
| | Baseline | Day 1 | Day 7 |
| Vonoprazan 20 mg | 11% | 71% | 86% |
| Esomeprazole 20 mg | 11% | 24% | 61% |

**Vonoprazan for the Potential Treatment of Acid-Related GI Diseases**

Given the shortcomings of PPI therapy, we believe that there is a significant unmet medical need for a safe and effective anti-secretory agent with rapid, potent, and durable activity. Vonoprazan was developed in markets outside of the United States by Takeda through an extensive clinical program, including 17 Phase 3 clinical trials. As of December 2018, 6,683 subjects were exposed to vonoprazan in completed and ongoing clinical trials. In head-to-head Phase 3 trials versus a PPI, vonoprazan demonstrated faster onset of healing in more severe erosive esophagitis patients, lower recurrence rates of erosions in erosive esophagitis patients across all levels of severity, and a superior eradication rate in combination with antibiotics in patients with *H. pylori* infection than PPI-based triple therapy. Vonoprazan received marketing approval in Japan in late 2014 and generated over $500 million in net sales in its fourth full year on the market in Japan. We plan to initiate a single pivotal Phase 3 clinical trial of vonoprazan in each of erosive esophagitis and *H. pylori* infection in the fourth quarter of 2019. We expect to report top-line data from both trials in 2021, and if successful, file regulatory submissions for marketing approval for the treatment of *H. pylori* infection in 2021 and for erosive esophagitis in 2022.

**Vonoprazan in GERD**

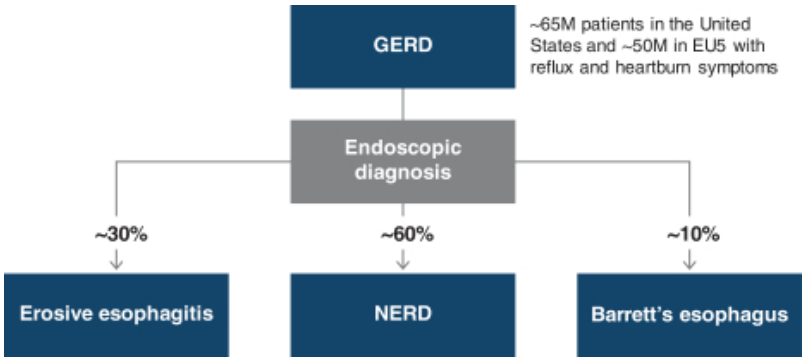
Based on the significant unmet medical need, previous Phase 3 trial results, and commercial potential, we have prioritized the development of vonoprazan in GERD in:

- the healing of erosive esophagitis and relief of heartburn; and
- the maintenance of healing of erosive esophagitis and relief of heartburn.

***GERD Disease Overview***

GERD is one of the most prevalent diseases of any kind and is the most prevalent GI disease, affecting approximately 20% of the U.S. population and approximately 15% of the European population. We estimate there are approximately 65 million individuals with GERD in the United States and 50 million individuals with GERD in the EU5. GERD is a disease that develops when the reflux of acidic stomach contents into the esophagus causes troublesome symptoms and/or complications, and the term covers a spectrum of diseases, including erosive esophagitis, non-erosive reflux disease, and Barrett's esophagus. These diseases are detailed below:

- ***Erosive esophagitis***: Approximately 30% of GERD patients have erosive esophagitis, which is classified by erosions in the gastric mucosa caused by acidic reflux of stomach contents into the esophagus. Erosive esophagitis is commonly graded by the Los Angeles classification system, which characterizes the extent of erosions in the esophagus and is graded on a scale of increasing severity from A to D, with D being the most severe. Approximately 10% to 20% of erosive esophagitis patients have the more severe Los Angeles Class C or D disease.
- ***Non-erosive reflux disease (NERD)***: Approximately 60% of GERD patients have NERD, which is classified by an endoscopically normal esophagus, but abnormal gastric acid exposure in the esophagus and persistent symptoms.
- ***Barrett's esophagus***: Approximately 10% of GERD patients have Barrett's esophagus, which is classified by endoscopic and histological evidence of metaplasia or dysplasia in the mucosal cell lining in the lower portion of the esophagus; approximately 1% of patients annually progress to esophageal cancer.




GERD patients typically present with heartburn and reflux symptoms. Based on these symptoms, patients are typically treated first-line with PPIs prior to a diagnostic endoscopy for specific disease classification of erosive esophagitis, NERD or Barrett's esophagus. Clinical guidelines suggest that endoscopy only be performed in patients who continue to have symptoms despite a four- to-eight-week course of daily PPIs or have alarm symptoms, including GI bleeding, anemia, weight loss, chest pain, or difficult or painful swallowing. Our market research suggests that most patients are treated empirically based on symptoms rather than based on endoscopic characterization of disease.

***GERD Treatment Paradigm***

Approximately 80% of GERD patients are pharmacologically treated with prescription or OTC medications. PPIs are currently the most effective anti-secretory agents available in the United States and Europe for relieving GERD symptoms and healing erosions in gastric mucosa. Our market research suggests that approximately 80% of patients who are pharmacologically treated receive PPIs, and approximately 75% of PPI use is prescription rather than OTC. The majority of PPI use is chronic, with more than 70% of patients prescribed PPIs for daily use. According to IQVIA NDTI, there were approximately 120 million oral PPI prescriptions written in the United States and 6.1 billion doses prescribed for the 12 months ended May 31, 2019.

While PPIs provide clinically meaningful symptom relief and healing for millions of patients suffering from acid-related GI diseases, they are inadequate for many patients. The suboptimal anti-secretory profile of PPIs results in slow onset of symptom relief, breakthrough nighttime or postprandial heartburn, and treatment failure. Approximately 15% to 45% of GERD patients are inadequately treated with PPIs, experiencing persistent, troublesome symptoms, such as heartburn and regurgitation. In approximately two thirds of symptomatic GERD patients, reflux symptoms are not adequately controlled after the first dose of a PPI, and nearly 50% of patients still suffer from symptoms three days later. Given these limitations, more than 20% of GERD patients on PPI therapy are taking their PPI twice daily, which is not FDA approved, or purchasing OTC heartburn treatments in addition to their prescription medicine. In a survey of approximately 1,000 GERD patients and 1,000 physicians, approximately one-third of GERD patients reported persistent symptoms and were dissatisfied with PPI therapy and 35% of physicians perceived patients as somewhat satisfied to completely dissatisfied with PPI treatment. In our U.S. market research study, physicians highlighted control of nighttime and daytime heartburn symptoms and efficacy in the healing and maintenance of healing of esophageal erosions as key unmet needs in GERD and reported that approximately 25% of patients are not satisfied on PPIs.

There are few treatment options for GERD patients who are inadequately managed on PPI therapy. Our U.S. market research survey reported that 26% of patients who are unsatisfied with therapy on a given PPI will switch to a different PPI to improve symptom control or heal esophageal erosions; however, physicians surveyed did not believe there are meaningful differences in outcomes between PPIs. Even though safety and efficacy of twice daily dosing of PPIs has not been evaluated in large controlled clinical studies and is not included on the label for any PPIs, surveyed physicians reported that 23% of patients resort to this dosing regimen given dissatisfaction of once daily PPIs. A limited number of patients proceed to a surgical procedure, such as Nissen fundoplication. However, this procedure results in postoperative morbidity of 5% to 20%, as well as a two- to six-week recovery period and a median hospital stay of two days.

Vonoprazan has the potential to be the first gastric anti-secretory agent from a novel class approved in the United States, Europe, or Canada in over 30 years. Our U.S. market research survey reported that physicians would prefer to use vonoprazan in 59% of all of their GERD patients and believe that vonoprazan's mechanism of action and gastric pH control is meaningfully improved over PPIs, that vonoprazan could be a more effective treatment than PPIs in healing and maintenance of healing of esophageal erosions, and that vonoprazan would improve their ability to treat GERD patients.

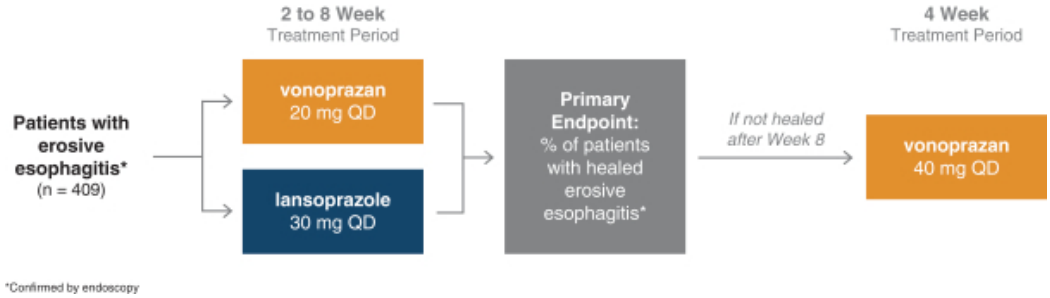
***Clinical Data for Vonoprazan in GERD***

Four Phase 3 clinical trials have been completed comparing vonoprazan to PPIs in erosive esophagitis: a healing trial in Japan; a maintenance of healing trial in Japan; a healing trial in Asia (China, Taiwan, and Korea); and a maintenance of healing trial in Asia. In addition to these Phase 3 trials, several published investigator-sponsored studies have compared vonoprazan to PPIs across dosing regimens and endpoints. Results of these clinical trials are summarized below.

*Healing of Erosive Esophagitis Clinical Trials in Japan and Asia*

In a Phase 3 multicenter, randomized, double-blind, parallel group trial, 409 patients in Japan with endoscopically confirmed erosive esophagitis were randomized to receive vonoprazan 20 mg QD or lansoprazole 30 mg QD for up to eight weeks. The primary endpoint was the non-inferiority of the percent of patients with healed erosive esophagitis up to Week 8, as assessed by endoscopy. Non-inferiority is intended to show that the effect of a new treatment is not worse than the active control by more than a specified margin, while superiority is intended to show that one treatment is more effective than a comparator by any margin.

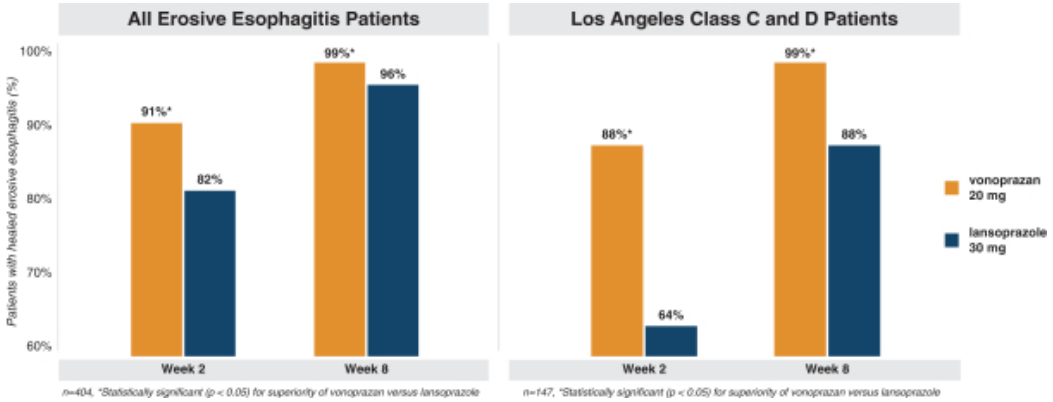
**Design of Japan Phase 3 Clinical Trial for the Healing of Erosive Esophagitis**




Vonoprazan achieved the primary endpoint of non-inferiority versus lansoprazole on the percent of patients with healed erosive esophagitis up to Week 8 (99% vs. 96%, p<0.0001). Further, a post hoc analysis demonstrated that vonoprazan was superior to lansoprazole on the percent of patients with healed erosive esophagitis up to Week 8 (p=0.0337). In the subset of 147 patients with more severe erosive esophagitis of Los Angeles Class C or D, vonoprazan healing was also shown to be superior (99% vs. 88%, p=0.0082). We believe this result is due to the improved acid control of vonoprazan over lansoprazole, and we believe lansoprazole is representative of the PPI class.

Vonoprazan further demonstrated a more rapid clinical effect versus lansoprazole with a superior healing rate at Week 2 (91% vs. 82%, p<0.0001 for non-inferiority and p=0.0132 in a post hoc superiority analysis). The treatment effect was more pronounced in the more severe patients with Los Angeles Class C or D disease (88% vs. 64%, p=0.0008 for superiority). Of the seven patients who failed lansoprazole treatment and continued into the additional treatment period, six healed with four weeks of treatment of 40 mg vonoprazan QD.

**Results of Japan Phase 3 Clinical Trial in the Healing of Erosive Esophagitis**



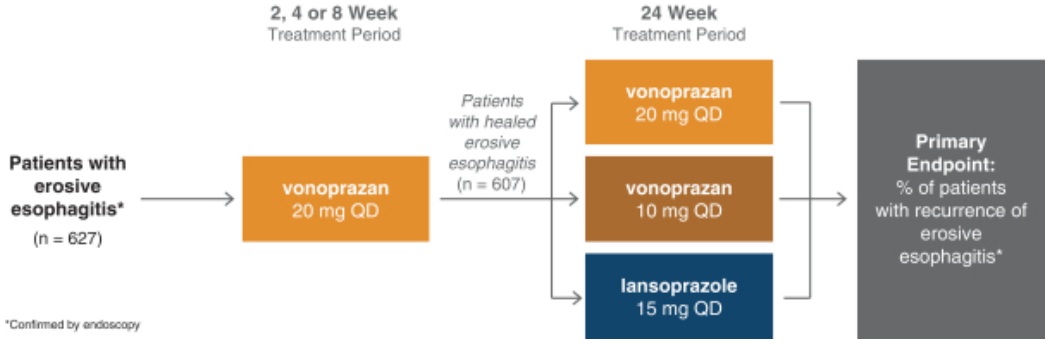

In addition, in the lead-in period of the Japan Phase 3 maintenance of healing clinical trial discussed below, patients were treated with vonoprazan 20 mg for up to eight weeks before proceeding into treatment for the maintenance of healing of erosive esophagitis. The healing rate at Week 2 and through Week 8 during this lead-in healing period was 91% and 99%, respectively.

In another multicenter, randomized, double-blind, parallel group Phase 3 clinical trial in China, Taiwan, Korea, and Malaysia, 481 patients with endoscopically confirmed erosive esophagitis were randomized to receive vonoprazan 20 mg QD or lansoprazole 30 mg QD for eight weeks. Vonoprazan achieved the primary endpoint of non-inferiority versus lansoprazole on the percent of patients with healed erosive esophagitis up to Week 8, 92% and 91%, respectively (95% confidence interval of treatment difference of -3.8% to 6.1%). The difference in healing rates of 1% between the treatment groups had a confidence interval of -3.8 to 6.1, which means that statistically there is 95% certainty that the true difference in healing rates lies within this range of values. Non-inferiority was established in this trial as the lower bound (-3.8%) of the confidence interval was greater than the pre-established non-inferiority margin of -10%.

*Maintenance of Healing of Erosive Esophagitis Clinical Trials in Japan and Asia*

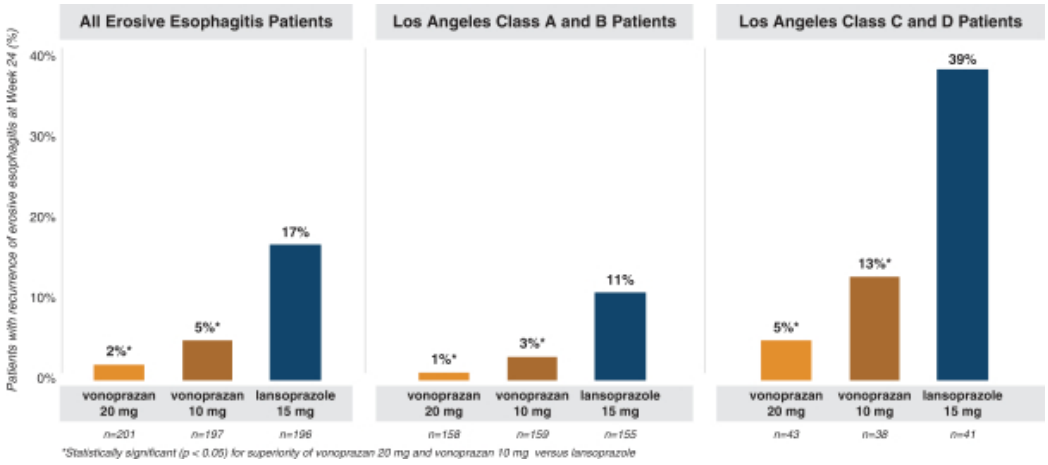
In a multicenter, randomized, double-blind, parallel-group Phase 3 clinical trial in Japan, 627 patients with erosive esophagitis were treated with vonoprazan 20 mg QD for two, four, or eight weeks. After this lead-in period, a total of 607 patients with healed erosive esophagitis, of whom 124 had Los Angeles Class C or D disease, were randomized to receive vonoprazan 10 mg QD, vonoprazan 20 mg QD, or lansoprazole 15 mg QD for 24 weeks. The primary endpoint was the percent of patients with recurrence of erosive esophagitis at Week 24 as assessed by endoscopy.

**Design of Japan Phase 3 Clinical Trial in Maintenance of Healing of Erosive Esophagitis**




Vonoprazan achieved the primary endpoint of non-inferiority versus lansoprazole on the percent of patients with recurrence of erosive esophagitis during the 24-week maintenance period. Patients on lansoprazole had a 17% recurrence rate of erosive esophagitis after 24 weeks of daily treatment, versus 5% for patients on vonoprazan 10 mg and 2% for patients on vonoprazan 20 mg ($p<0.0001$ for non-inferiority of both vonoprazan doses vs. lansoprazole). Both vonoprazan doses were superior to lansoprazole in a post hoc analysis ($p=0.0002$ for vonoprazan 10 mg and $p<0.0001$ for vonoprazan 20 mg). As shown below, the superiority of each dose of vonoprazan to lansoprazole was demonstrated in both Los Angeles Class A and B patients, as well as the more severe Los Angeles Class C and D patients. We believe this result demonstrates the improved potency and durability of vonoprazan versus lansoprazole in all patients with erosive esophagitis.

**Results of Japan Phase 3 Clinical Trial in Maintenance of Healing of Erosive Esophagitis**

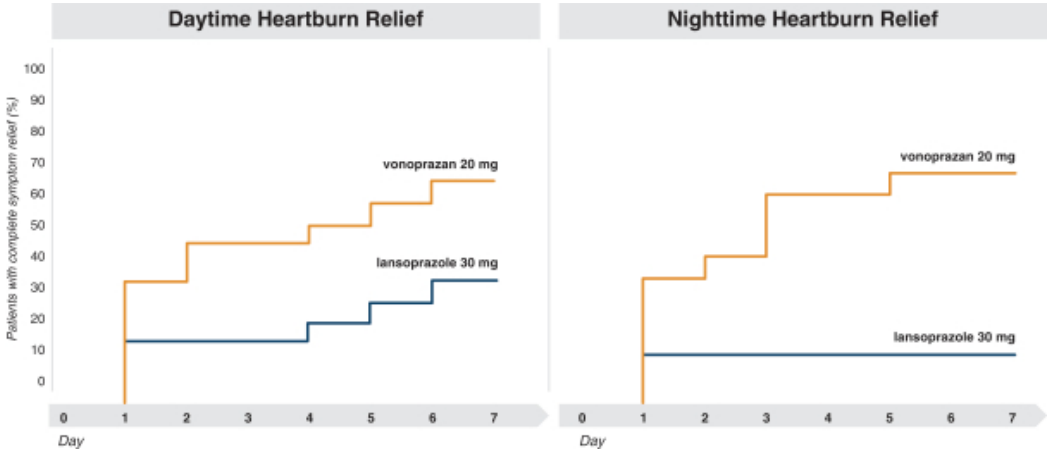



A second multicenter, randomized, double-blind, parallel group Phase 3 clinical trial was conducted in China, Taiwan, and Korea in 703 patients with healed erosive esophagitis, who were randomized to receive vonoprazan 20 mg QD, vonoprazan 10 mg QD, or lansoprazole 15 mg QD for 24 weeks. This trial has been completed, but final results are not yet available.

***Symptom Relief***

We believe the rapid pharmacodynamic effects of vonoprazan may provide complete and sustained heartburn relief more quickly compared to PPIs. A double-blind, randomized, investigator-sponsored clinical trial in 32 patients with erosive esophagitis compared the effects of vonoprazan 20 mg and lansoprazole 30 mg on the time to achieve complete heartburn relief, defined as seven days without heartburn symptoms. Vonoprazan demonstrated a faster time to complete heartburn relief than lansoprazole, and this complete relief was most pronounced for nighttime heartburn. The results of the trial are summarized below. We plan to evaluate a similar endpoint in our planned Phase 3 clinical trial.

**Faster Onset and Higher Rate of Complete Heartburn Relief**




***On-Demand Dosing***

We believe the rapid onset of action of vonoprazan may also enable on-demand, or as needed, use for the relief of symptoms as an alternative to chronic daily treatment. In two open-label, investigator-sponsored clinical trials in Japan, one in erosive esophagitis and a second in NERD, the effectiveness of vonoprazan as an on-demand therapy was compared to that of daily PPI therapy with a number of different PPIs. In both clinical trials, patients utilized approximately 80% fewer doses of vonoprazan compared to PPIs but demonstrated similar levels of patient satisfaction.

***Our Erosive Esophagitis Phase 3 Program***

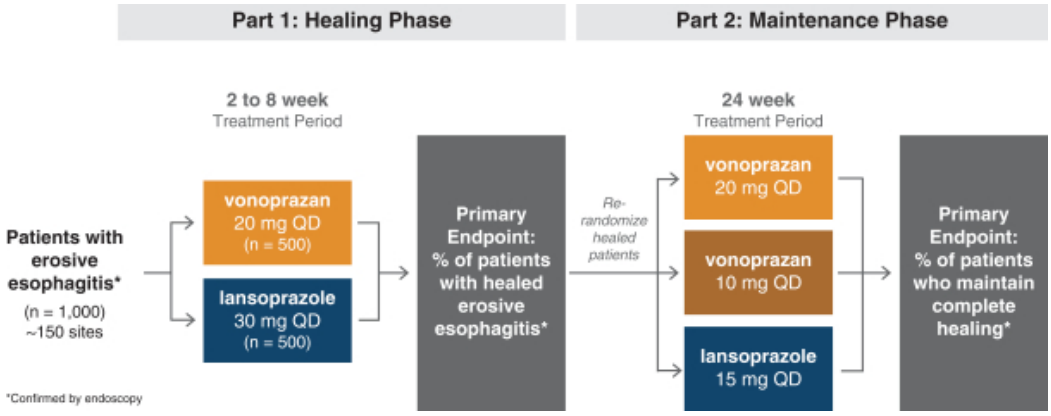
We plan to initiate a single Phase 3 clinical trial of vonoprazan to assess the healing of erosive esophagitis and relief of heartburn, and the maintenance of healing of erosive esophagitis and relief of heartburn in the fourth quarter of 2019. Our IND for vonoprazan in erosive esophagitis was accepted by the FDA in September 2019.

We plan to enroll approximately 1,000 patients with endoscopically confirmed erosive esophagitis in this clinical trial and enrich the clinical trial for more severe patients, targeting 30% Los Angeles Class C or D patients. The clinical trial will have both a healing phase and a maintenance phase. As patients will be re-randomized between the healing phase and the maintenance phase, each phase will be analyzed independently and have independent primary and secondary endpoints.

- ***Healing phase****:* During the healing phase, patients will be randomized 1:1 to receive either vonoprazan 20 mg QD or lansoprazole 30 mg QD for up to eight weeks. The lansoprazole 30 mg QD dose is recommended in the FDA prescribing information for lansoprazole. The primary endpoint for this phase will be the percentage of patients with complete healing of erosive esophagitis by Week 8 as assessed by endoscopy with a primary analysis of non-inferiority. If non-inferiority is demonstrated, then an analysis for superiority will also be performed. Key secondary endpoints will include: the percentage of patients with complete healing of erosive esophagitis at Week 2; percentage of patients with Los Angeles Class C or D erosive esophagitis disease with complete healing at Week 2 and Week 8; percentage of patients with onset of complete heartburn relief by Day 3 of treatment; and the percentage of 24-hour heartburn free days over the healing phase.
- ***Maintenance phase****:* Patients with complete healing of erosive esophagitis at Week 2 or Week 8 in the healing phase will be re-randomized 1:1:1 into the maintenance phase. During this phase, patients will receive either vonoprazan 10 mg QD, vonoprazan 20 mg QD, or lansoprazole 15 mg QD for 24 weeks. The lansoprazole 15 mg QD dose is recommended in the FDA prescribing information for the maintenance of healing indication. The primary endpoint for this phase will be the percent of patients who maintain complete healing after 24 weeks as assessed by endoscopy with a primary analysis of non-inferiority. If non-inferiority is demonstrated, then an analysis for superiority will also be performed. Key secondary endpoints will include the percentage of patients with Los Angeles Class C or D erosive esophagitis disease who maintain complete healing after 24 weeks and the percentage of 24-hour heartburn free days over the maintenance phase.

Our Phase 3 trial design is modeled after the successful Phase 3 clinical trials conducted in Japan and Asia with limited differences other than combining both the healing and maintenance of erosive esophagitis into a single study. In Japan and Asia, separate clinical trials were conducted for each of these indications. We believe we can simplify patient recruitment by conducting a single clinical trial and re-randomizing patients between phases.

**Design for Planned Phase 3 Erosive Esophagitis Clinical Trial**




We expect to report top-line data from this trial in 2021 and, if successful, file a regulatory submission for marketing approval in 2022.

**Vonoprazan in Combination with Antibiotics for the Treatment of *H. pylori* Infection**

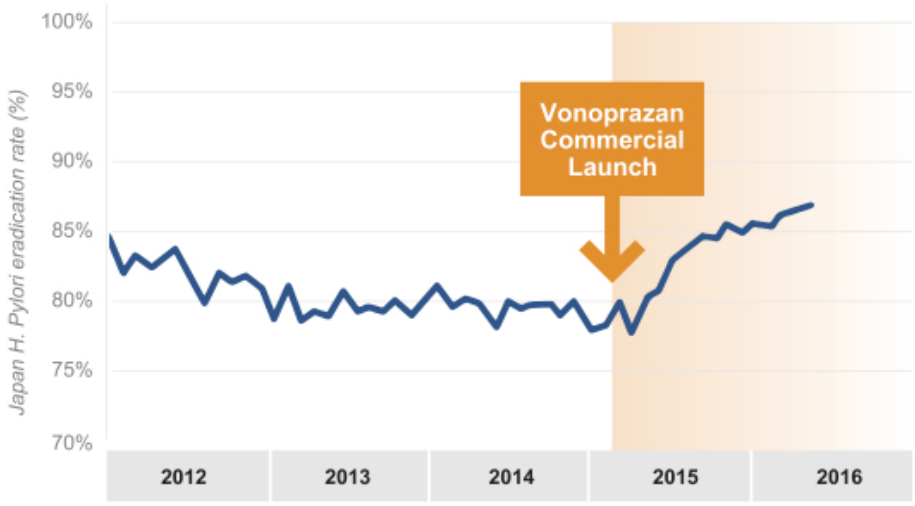
***Disease Burden and Outcomes***

*H. pylori* is a bacterial pathogen that infects approximately 35% of the U.S. population and 45% of the EU5 population. We estimate that there are approximately 115 million individuals in the United States and 145 million individuals in the EU5 infected with *H. pylori*, and we believe there are approximately 2.5 million patients treated for *H. pylori* infection in the United States each year. As a result of the chronic inflammation induced by *H. pylori* infection, approximately 20% of infected patients develop a range of pathologies including dyspepsia, peptic ulcer disease, gastric cancer, and mucosa-associated lymphoid tissue (MALT) lymphoma. Gastric cancer is the third most common cause of cancer-related death worldwide, and over 80% of gastric cancers are attributed to *H. pylori* infection. Globally there are more than one million new cases of gastric cancer and approximately 782,000 deaths each year. Eradication of *H. pylori* infection has been proven to reduce the incidence of gastric cancer, and the American College of Gastroenterologists, or ACG, guidelines recommend treatment for all patients diagnosed with *H. pylori* infection.

*H. pylori* eradication rates have fallen from >90% in the 1990s to current rates of <80% due to increasing antibiotic resistance. In 2017, the World Health Organization (WHO) listed *H. pylori* among the 16 antibiotic-resistant bacteria that pose the greatest threat to human health and designated *H. pylori* as a Class 1 carcinogen, meaning that it is a definite known cause of cancer. In 2014, the FDA added *H. pylori* to the agency's list of qualifying pathogens that have the potential to pose a serious threat to public health under the GAIN Act. We believe that vonoprazan-based treatment regimens have the potential to restore eradication rates to greater than 90% in the United States and Europe given the clinical and post-marketing experience in the Japanese market.

A recent study compiled real-world health insurance claims data in Japan from 2008 to 2016 for *H. pylori* eradication. Prior to vonoprazan's approval in late 2014, the *H. pylori* eradication rate across Japan fell to below 80% as shown in the figure below. Approximately one year after vonoprazan's launch, the eradication rate increased to greater than 85%. From January 2015 to March 2016, the eradication rate with PPI-containing regimens in Japan was between 78% and 82% while the eradication rate with vonoprazan-containing regimens was 91% across all claims in this analysis.

**Eradication Rate of *H. pylori* Infection in Japan Before and After Launch of Vonoprazan**



In Japan, vonoprazan-containing regimens have become the most common first line treatment. One-year post launch, approximately 80% of all treated *H. pylori*-infected patients received vonoprazan-based regimens as shown below.

**Current Treatment Paradigm in the United States and Europe**

The ACG treatment guidelines for *H. pylori* infection recommend using PPIs in conjunction with antibiotics to improve antibiotic efficacy against *H. pylori* infection. The use of anti-secretory agents enhances the effect of antibiotics in two ways. First, anti-secretory agents increase gastric pH, which in turn increases the stability of the antibiotics. For example, amoxicillin and clarithromycin are chemically unstable at the low pH typically found in the human stomach. Second, several antibiotics, including amoxicillin and clarithromycin, are most potent against *H. pylori* at the time of maximum bacterial replication, which occurs at pH 6.0 to 7.0. *H. pylori* is in a dormant state at lower pH values, which reduces the effectiveness of the antibiotics.

The table below shows the minimum inhibitory concentration of antibiotic required to eradicate 90% of *H. pylori in vitro*, or $MIC_{90}$. As pH increases, the amount of antibiotic required for 90% eradication decreases substantially.

***H. pylori* $MIC_{90}$ Values as a Function of pH**

| | $MIC_{90}$ (mg/L) | | |
|---|---|---|---|
| | pH 7.5 | pH 6.0 | pH 5.5 |
| Ampicillin | 0.06 | 0.25 | 0.5 |
| Clarithromycin | 0.03 | 0.06 | 0.25 |

A triple therapy regimen (PPI, clarithromycin, and either amoxicillin or metronidazole) is the most commonly used in clinical practice for the first-line treatment of *H. pylori* infection. However, *H. pylori* eradication rates with PPI triple therapy have fallen from >90% in the 1990s to current levels of <80%, primarily due to increased resistance of *H. pylori* to clarithromycin and metronidazole. A recent meta-analysis indicates that U.S. resistance rates measured from 2012 to 2016 were 20% for clarithromycin, 29% for metronidazole, and 19% for levofloxacin. These figures represent a marked increase from 2009 to 2011 for both clarithromycin and metronidazole, for which resistance was 9% for clarithromycin, 21% for metronidazole, and 11% for levofloxacin. *H. pylori* resistance to amoxicillin remains low despite its use in most triple therapy regimens; resistance is generally <2% among isolates in the United States and Europe. There is a similar trend of increasing resistance to key antibiotics in Europe.

Given the declining eradication rates for *H. pylori,* quadruple therapy is recommended as first-line treatment in areas with known high rates of clarithromycin or metronidazole resistance; however, our U.S. market research study reported that physicians prescribe quadruple therapy to only 17% of first-line patients. The surveyed physicians are concerned with patient adherence to treatment and patient compliance and tolerability issues associated with dosing multiple drugs at multiple times throughout the day. Further, geographic patterns of resistance in the United States are poorly understood and treatment is largely empiric, with susceptibility testing rarely conducted prior to first-line treatment. Our U.S. market research study reported that only 8% and 16% of physicians conduct resistance testing prior to prescribing treatment for first-line and second-line *H. pylori* infection, respectively.

In our U.S. market research study, physicians highlighted the need for more effective and simpler first-line treatment options. For the treatment of *H. pylori* infection, surveyed physicians highlighted the declining eradication rate and low patient compliance rate with treatment regimens as key unmet needs, and 93% of these physicians believe that vonoprazan offers clinically meaningful benefits over PPIs. Surveyed physicians reported that they would prefer to use vonoprazan dual or triple therapy in, on average, 67% of first-line and 69% of second-line patients with *H. pylori* infection.

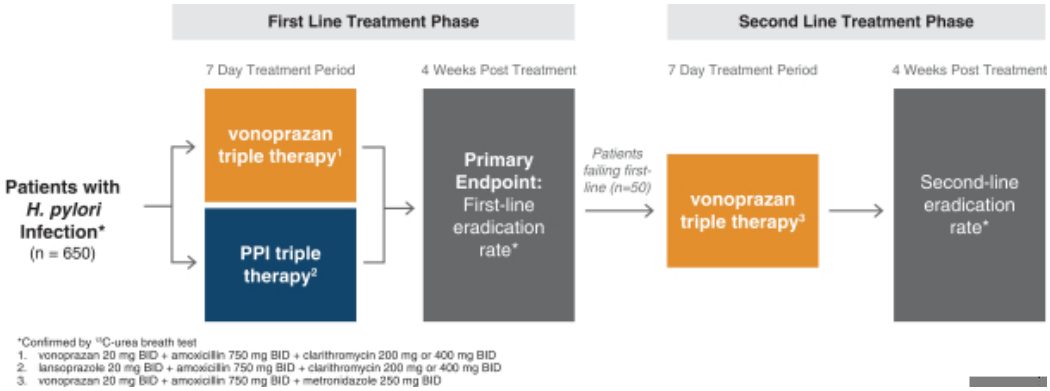
***Phase 3 Clinical Trial in Japan of Vonoprazan in Combination with Antibiotics to Treat H. pylori Infection***

A randomized, double-blind, multicenter Phase 3 clinical trial in *H. pylori*-positive patients was completed in Japan. Patients with *H. pylori* infection and a history of gastric or duodenal ulcer who had not previously received *H. pylori* treatment were eligible for inclusion in the clinical trial. A total of 650 patients were randomized to receive seven days of:

- ***vonoprazan triple therapy***: vonoprazan 20 mg twice daily, or BID, amoxicillin 750 mg BID, and clarithromycin (200 mg or 400 mg) BID; or
- ***lansoprazole triple therapy***: lansoprazole 30 mg BID, amoxicillin 750 mg BID, and clarithromycin (200 mg or 400 mg) BID.

Patients who did not achieve *H. pylori* eradication after first-line treatment received a second-line regimen of vonoprazan 20 mg BID, amoxicillin 750 mg BID, and metronidazole 250 mg BID for seven days.

**Design of Japan Phase 3 *H. pylori* Treatment Clinical Trial**

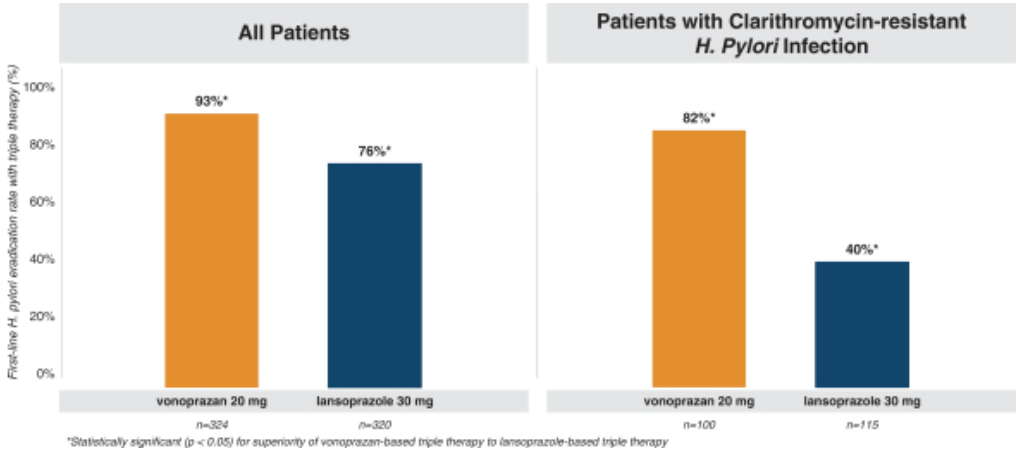



The primary endpoint of the clinical trial was confirmed *H. pylori* eradication determined by $^{13}$C-urea breath test, a standard test for the diagnosis of *H. pylori*, four weeks after the completion of treatment. The primary analysis was non-inferiority, and key secondary endpoints included the second line eradication rate and eradication rate in antibiotic-resistant subgroups.

Vonoprazan-based triple therapy demonstrated a non-inferior eradication rate of 93% compared to 76% for lansoprazole-based triple therapy ($p<0.0001$). Post hoc analyses indicated that vonoprazan-based triple therapy was superior to lansoprazole-based triple therapy ($p<0.0001$). Patients who were not eradicated on vonoprazan-based triple therapy or lansoprazole-based triple therapy were treated with a triple therapy regimen of vonoprazan, amoxicillin, and metronidazole. In this second-line setting, the *H. pylori* eradication rate with vonoprazan triple therapy was 98%. Across

first- and second-line patients, the *H. pylori* eradication rate in clarithromycin resistant strains was higher with vonoprazan-based triple therapy (82%) than with lansoprazole-based triple therapy (40%) as shown below. We believe that this result is significant, as *H. pylori* antibiotic resistance testing is rare in the United States, and *H. pylori* treatment is generally empiric.

**Results of Japan Phase 3 Clinical Trial in the Treatment of *H. pylori* Infection**

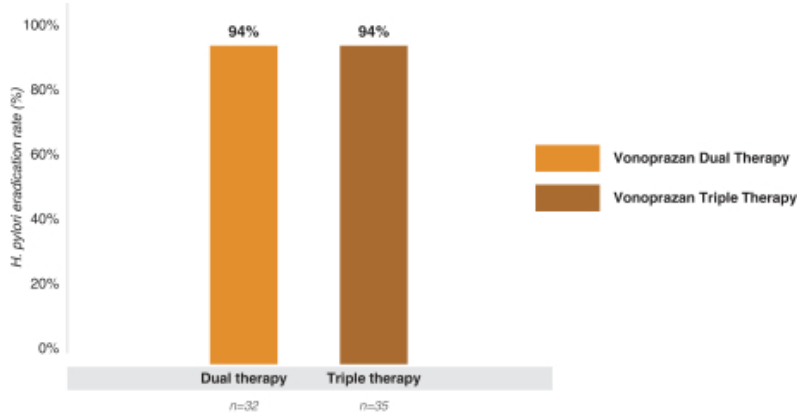



***Other Studies of Vonoprazan in H. pylori Treatment***

A meta-analysis of 14 studies in Japan with over 14,636 patients found that the pooled eradication rates of vonoprazan-containing regimens were superior to those of PPI-containing regimens in a first-line setting (85% vs. 68%, p<0.00001). Subgroup analysis further indicated the superiority of vonoprazan in patients with either clarithromycin-resistant strains (82% vs. 41%, p<0.00001) or clarithromycin-susceptible strains (95% vs 90%, p=0.006). A second study retrospectively confirmed that empiric vonoprazan-based triple therapy was non-inferior to PPI-based triple therapy based on *H. pylori* antibiotic susceptibility testing.

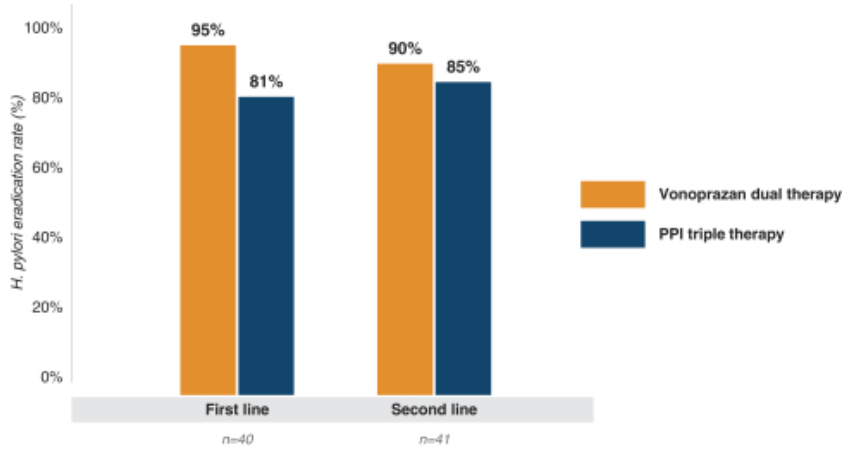
In addition to demonstrating superiority to PPIs in triple therapy regimens, vonoprazan was studied in a dual therapy regimen with amoxicillin in two investigator-initiated clinical trials in Japan. The first trial involving 67 Japanese patients assessed vonoprazan dual therapy (vonoprazan 20 mg BID in combination with amoxicillin 500 mg three times daily, or TID, for seven days) compared to vonoprazan triple therapy (vonoprazan 20 mg BID in combination with amoxicillin 750 mg BID and clarithromycin 200 mg BID for seven days). As shown below, vonoprazan dual therapy was similarly efficacious to vonoprazan triple therapy (eradication rates of 94% in both treatment arms).

**Results of Vonoprazan Dual and Triple Therapy in the Treatment of *H. pylori* Infection**




A second clinical trial compared vonoprazan-based dual therapy to esomeprazole or rabeprazole PPI-based triple therapy. This clinical trial enrolled 81 Japanese patients including 40 first-line treatment patients and 41 second-line treatment patients who had failed standard therapy and compared vonoprazan dual therapy and PPI triple therapy in both first- and second-line therapy. Patients assigned to vonoprazan dual therapy were treated with vonoprazan 20 mg BID in combination with amoxicillin 500 mg TID for seven days. Patients assigned to PPI triple therapy were treated first-line with esomeprazole 20 mg or rabeprazole 10 mg BID, amoxicillin 750 mg BID, and clarithromycin 200 mg BID or second-line with esomeprazole 20 mg or rabeprazole 10 mg BID, amoxicillin 750 mg BID, and metronidazole 250 mg BID for seven days. As shown below, dual therapy with vonoprazan was efficacious in both first- and second-line therapy with eradication rates of 95% and 90%, respectively, versus 81% and 85% for PPI-based triple therapies.

**Results of Vonoprazan Dual and PPI Triple Therapy in the Treatment of *H. pylori* Infection**




Antibiotic resistance is a significant clinical issue, and we believe that vonoprazan has the potential to address the growing resistance to *H. pylori* by eradicating infection after first-line of treatment. Vonoprazan dual therapy has further potential for improved convenience and compliance

over triple or quadruple therapy regimens, and importantly, spares the use of clarithromycin, metronidazole, and levofloxacin, representing an opportunity both for effective treatment and sound antibiotic stewardship through the avoidance of additional antibiotics to which *H. pylori* is known to acquire resistance. Less frequent use of these antibiotics, which have important roles aside from the treatment of *H. pylori* infection, may help to limit the spread of resistance among other pathogenic bacteria within populations.

***Our H. pylori Phase 3 Program***

We plan to initiate a Phase 3 clinical trial of vonoprazan for the treatment of *H. pylori* infection. Our INDs for vonoprazan in treatment of *H. pylori* infection were accepted by the FDA in September 2019. In August 2019, we received QIDP designation from the FDA for vonoprazan in combination with both amoxicillin and clarithromycin and in combination with amoxicillin alone for the treatment of *H. pylori* infection. Subject to limited exceptions, QIDP designation extends any non-patent marketing exclusivity by an additional five years, and also provides potential eligibility for priority review and fast track designation.

We plan to enroll approximately 975 patients with *H. pylori* infection as assessed by $^{13}$C-urea breath test in this clinical trial. The clinical trial will compare vonoprazan dual therapy and vonoprazan triple therapy regimens each head-to-head with a standard of care lansoprazole triple therapy regimen. Patients will be randomized in a 1:1:1 manner into the three treatment arms as follows:

- ***vonoprazan dual therapy***: vonoprazan 20 mg BID and amoxicillin 1 g TID for 14 days;
- ***vonoprazan triple therapy***: vonoprazan 20 mg BID, amoxicillin 1 g BID and clarithromycin 500 mg BID for 14 days; and
- ***PPI triple therapy***: lansoprazole 30 mg BID, amoxicillin 1 g BID and clarithromycin 500 mg BID for 14 days.

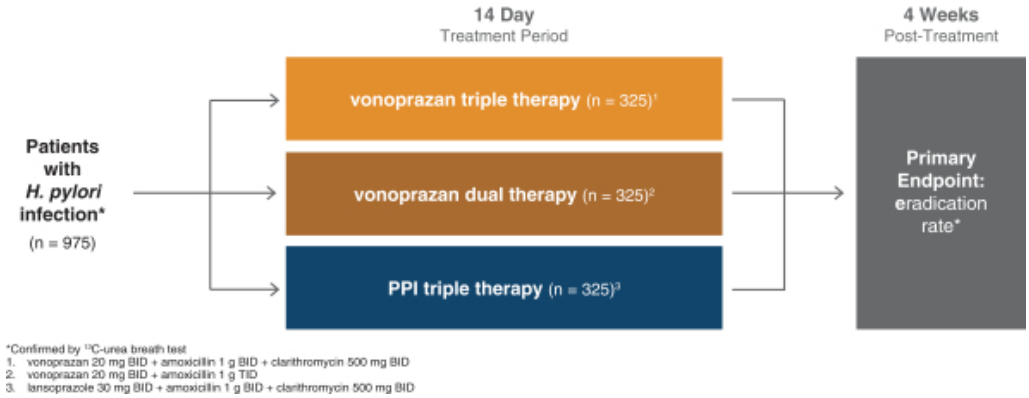
The primary endpoint for this trial will be the percentage of patients with successful eradication of *H. pylori* infection as assessed by $^{13}$C-urea breath test four weeks after completion of treatment. The primary analysis will assess the non-inferiority of vonoprazan dual therapy to lansoprazole triple therapy and vonoprazan triple therapy to lansoprazole triple therapy excluding patients who have *H. pylori* infection that is resistant to clarithromycin or amoxicillin. We will also conduct secondary analyses for superiority in all patients regardless of antibiotic resistance and in patients with clarithromycin-resistant *H. pylori* infection.

Our Phase 3 trial design is modeled after the successful Phase 3 clinical trial conducted in Japan. Key differences include:

- ***Inclusion of patients with H. pylori infection and dyspeptic symptoms***. Our clinical trial will enroll patients with active *H. pylori* infection and dyspeptic symptoms. The Japan Phase 3 trial enrolled patients with *H. pylori* infection and a history of gastric or duodenal ulcers;
- ***Treatment duration and antibiotic doses***. Standard of care regimens in Western countries include higher doses of antibiotics and a longer duration of treatment (typically 14 days) than in Japan (typically seven days); and
- ***Inclusion of dual therapy arm***. Vonoprazan dual therapy has only been studied in investigator-initiated clinical trials and not yet in a pivotal trial.

Our clinical trial design conforms to standard of care treatment regimens in the United States and Europe and follows the ACG treatment guidelines.

**Design for Planned Phase 3 *H. pylori* Clinical Trial**

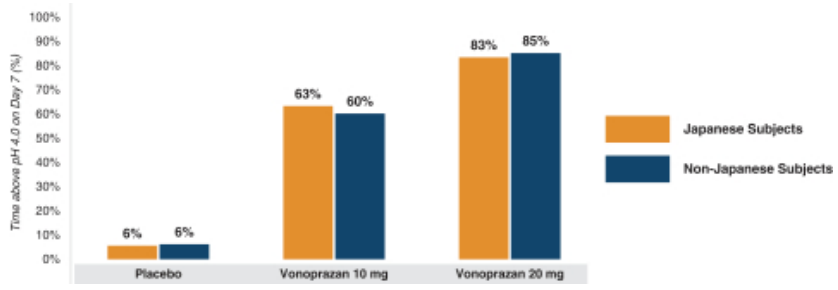



We expect to report top-line data from this trial in 2021 and, if successful, file a regulatory submission for marketing approval in 2021.

**Vonoprazan Pharmacokinetics and Pharmacodynamics in Japanese vs. non-Japanese Subjects**

The vonoprazan pharmacokinetic and pharmacodynamic profile is similar between Japanese and non-Japanese subjects as assessed in two randomized, double-blind, placebo-controlled Phase 1 clinical trials in healthy volunteers. Sixty Japanese subjects in the first study and 48 non-Japanese subjects in the second study, of whom 85% were Caucasian, received doses from 10 mg up to 40 mg QD for seven consecutive days. At all doses, pharmacokinetics between the two populations were similar. In addition, the pharmacodynamics were similar between Japanese and non-Japanese subjects as shown in the figure below. On Day 7, mean time above pH 4.0 for vonoprazan 20 mg QD was 83% for Japanese subjects and 85% for non-Japanese subjects. Night-time 12-hour time above pH 4.0 was 73% for Japanese subjects and 75% for non-Japanese subjects. We believe that these results show that vonoprazan has a similar profile in Japanese and non-Japanese subjects.

**Comparative Pharmacodynamics of Vonoprazan in Japanese and non-Japanese Subjects**




**Summary of Vonoprazan Safety Data**

***Safety in Clinical Studies***

As of December 2018, 6,683 subjects have been exposed to vonoprazan in completed and ongoing Phase 1 to 3 clinical trials. The doses studied have ranged from 1 to 120 mg with durations up

to one year. The most commonly reported adverse events, or AEs, in the clinical development program for vonoprazan, as reflected in the Japanese prescribing information published by Japan's Pharmaceuticals and Medical Devices Agency, or PMDA, were diarrhea, constipation, nausea, elevated liver enzymes, rash, and eosinophilia. All such events had an incidence rate of less than 5.0% other than diarrhea in the treatment of *H. pylori* which had an incidence rate of 10.6% in combination with antibiotics. No dose-related increase in treatment-emergent AEs, or TEAEs, or serious AEs was observed. The safety profile of vonoprazan and incidence of TEAEs, drug-related TEAEs, and TEAEs leading to drug discontinuation were similar between vonoprazan and lansoprazole across studies.

Certain earlier generation P-CABs previously under development by other companies may have been discontinued in-part due to their hepatic safety profile. These hepatic safety concerns may be compound-specific and not generalizable to the P-CAB class. It is notable that vonoprazan is based on a pyrrole chemical structure and is chemically distinct from previously discontinued P-CABs that were based on an imidazole structure. Vonoprazan has had a similar hepatic safety profile to lansoprazole across all clinical studies conducted by Takeda, in which 1.0% of subjects treated with vonoprazan 10 mg or 20 mg and 0.8% of subjects treated with lansoprazole 15 mg or 30 mg had ALT or AST elevations greater than three times the upper limit of normal or bilirubin elevations greater than two times the upper limit of normal.

***Vonoprazan Post-Marketing Safety in Japan***

The most recent post-marketing safety report from December 2018 includes an estimated 23 million patients who have received vonoprazan in Japan since its launch. Based on the post-marketing experience, the clinically significant adverse reactions section of the Japanese prescribing information for vonoprazan was updated to include skin reactions such as toxic epidermal necrolysis, Steven-Johnson syndrome, and erythema multiforme. The incidence of these skin reactions was considered extremely rare (less than 1 in 100,000 patients) and a causal relationship to vonoprazan could not be ruled out.

Serious hepatic adverse events have also been observed among patients exposed to vonoprazan in Japan in the post-marketing setting. These cases were typically confounded by comorbidities or other concomitant medications and believed to be idiosyncratic reactions. The incidence of these events was considered extremely rare (less than 1 in 100,000 patients). The post-marketing safety data, including the December 2018 post-marketing safety report and the reported hepatic safety events, have been submitted to the PMDA. To date, there have been no changes to the Japan prescribing information related to hepatic safety.

**Vonoprazan Launch in Japan**

***Vonoprazan Regulatory Status***

Vonoprazan first received approval in Japan on December 26, 2014 as TAKECAB® for the following indications:

- Healing and maintenance of healing of erosive esophagitis;
- Adjunct to antibiotics in *H. pylori* treatment;
- Gastric ulcer;
- Duodenal ulcer;
- Prevention of recurrence of gastric ulcer or duodenal ulcer during low-dose aspirin administration; and

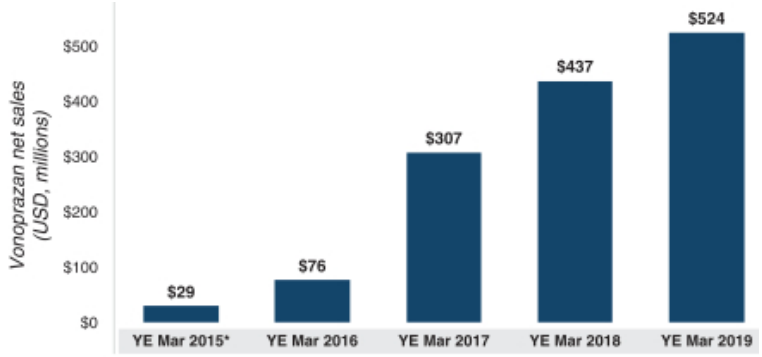
- Prevention of recurrence of gastric ulcer or duodenal ulcer during nonsteroidal anti-inflammatory drug (NSAID) administration.

Vonoprazan was subsequently approved in Japan in February 2016 for the treatment of *H. pylori* in combination packs with antibiotics (Vonosap Pack 400, Vonosap Pack 800, and Vonopion Pack), and as VOCINTI in the Philippines (October 2017), Singapore (March 2018), Thailand (July 2018), Argentina (September 2018), Peru (September 2018), South Korea (March 2019), Taiwan (March 2019), and Malaysia (May 2019). Vonoprazan is currently under review for approval by regulatory authorities in additional countries in Latin America and Asia, including China.

***Vonoprazan Commercialization in Japan***

Vonoprazan was approved in Japan in December 2014. In its fourth full year on the market vonoprazan generated $524 million in net sales, a 20% increase over the prior year. In addition, in the quarter ended June 30, 2019, vonoprazan generated $164.7 million in net sales, a 28% increase over the corresponding quarter from the prior fiscal year.

**Vonoprazan Net Sales Since Approval**




* Vonoprazan was approved in Japan in December 2014

We believe that the market dynamic for anti-secretory agents in Japan is similar to that in the United States. In both countries, the anti-secretory market is largely genericized. Ahead of the vonoprazan launch in Japan, all PPIs, other than Nexium, were available as generics. As of 2017, generic drugs in Japan represent approximately 70% of the market by volume, compared to the United States where generics are approximately 90% of the market by volume. Additionally, the Japanese government set a goal to increase generic use to 80% by 2020. Although vonoprazan and Dexilant are priced at a premium to generic PPIs in Japan and the United States, respectively, both have experienced commercial success.

**Vonoprazan Commercial Opportunity and Strategy**

The market for prevention and treatment of acid-related GI diseases in the United States and Europe is large. There were approximately 120 million oral PPI prescriptions written in the United States and 6.1 billion doses prescribed for the 12 months ended May 31, 2019. We estimate there are approximately 65 million individuals with GERD in the United States and 50 million individuals with GERD in the EU5, of whom 15% to 45% are inadequately treated with PPIs. In addition, we estimate that there are approximately 115 million individuals in the United States, of which 2.5 million are treated each year, and 145 million individuals in the EU5 infected with *H. pylori*.

Over many decades of use, multiple drug classes and individual drugs have demonstrated the substantial commercial opportunity for therapies treating acid-related GI diseases. H2RAs including Axid, Pepcid, Tagamet, and Zantac provided the first significant improvement in disease management over antacids and as a class reached $3.5 billion in annual sales. After H2RAs, PPIs emerged as the new standard of care. Prior to the introduction of generic and OTC alternatives, annual PPI class sales reached approximately $12.5 billion in the United States, and peak sales for individual brands were approximately $3.7 billion for Prilosec, approximately $3.5 billion for Nexium, and $3.4 billion for Prevacid.

As recently as 2015, the last branded PPI, Dexilant, reached approximately $530 million in sales in the United States despite limited differentiation from other PPIs. As of June 30, 2019, Dexilant was priced at a significant premium to generic PPIs on the market. Even with premium pricing, Dexilant obtained broad insurance coverage and favorable access. As of June 30, 2019, approximately 90% of commercially covered lives and 80% of Medicare covered lives had access to Dexilant. Furthermore, of those commercially covered lives, 65% had unrestricted access to the drug without prior authorization or step edits and 35% of patients had access at the lowest branded cost tier. We believe that, if approved in our markets, vonoprazan will be the first of the next generation of anti-secretory therapies to improve the standard of care for acid-related GI diseases by providing a safe and effective treatment option for the millions of patients in need of more potent, rapid, or durable acid suppression. Additionally, we believe the potential differentiation of vonoprazan compared to PPIs could result in attractive market access and formulary positioning.

In July 2019, we conducted a U.S. market research study which surveyed 100 gastroenterologists and 100 primary care physicians who commonly prescribe PPIs and treat patients with GERD and *H. pylori* infection. For the treatment of GERD, surveyed physicians highlighted control of nighttime and daytime heartburn symptoms and efficacy in the healing and maintenance of healing of esophageal erosions as key unmet needs. These physicians reported that vonoprazan's mechanism of action and gastric pH control is considered meaningfully improved over PPIs and that vonoprazan could be a more effective treatment than PPIs in healing and maintenance of healing of esophageal erosions. These physicians would prefer to use vonoprazan in, on average, 59% of all of their GERD patients. For the treatment of *H. pylori* infection, surveyed physicians highlighted the declining eradication rate and low patient compliance rate with treatment regimens as key unmet needs, and 93% of these physicians believe that vonoprazan offers clinically meaningful benefits over PPIs. Surveyed physicians reported that they would prefer to use vonoprazan dual or triple therapy in, on average, 67% of first-line and 69% of second-line patients with *H. pylori* infection.

**Sales and Marketing**

We do not currently have our own marketing, sales, or distribution capabilities. We plan to independently commercialize vonoprazan in the United States by building a leading specialty gastroenterology-focused commercial infrastructure to support the adoption of vonoprazan. We believe we can successfully launch vonoprazan in the United States with a focused specialty sales force targeting high prescribers of PPIs, particularly gastroenterologists. PPI prescribing is highly concentrated with approximately 1.5% of U.S. PPI prescribers (approximately 12,000 total) accounting for approximately 20% of PPI prescriptions and approximately 6.0% of U.S. PPI prescribers (approximately 50,000 total) accounting for approximately 50% of PPI prescriptions, according to IQVIA. We believe we have an opportunity to achieve significant share of voice and exposure to physicians given the scarcity of actively marketed anti-secretory medicines.

To address the commercial opportunity for vonoprazan in Europe and Canada, we plan to seek one or more partners with existing commercial infrastructure and expertise in these markets. Additional clinical trials of vonoprazan may be required to obtain regulatory approval and/or ensure access to these markets.

**Additional Vonoprazan Development Opportunities**

***Indications***

While we are initially focused on the development of vonoprazan for the treatment of erosive esophagitis and the treatment of *H. pylori* infection, we believe there are opportunities to expand the use of vonoprazan to other indications in our licensed territories. For example, in Japan, vonoprazan is also approved for the treatment of gastric ulcers, treatment of duodenal ulcers, prevention of recurrence of gastric ulcer or duodenal ulcer during low-dose aspirin administration, and prevention of recurrence of gastric ulcer or duodenal ulcer during NSAID administration.

In addition to those indications for which vonoprazan is approved in Japan, we believe there are additional opportunities to develop vonoprazan for the treatment of GI diseases.

***NERD.*** We believe that there is opportunity to broadly position vonoprazan's use in GERD with an indication in NERD, also known as symptomatic GERD, in addition to an indication in erosive esophagitis. We may develop vonoprazan in NERD with daily and/or on-demand, or as-needed, dosing regimens. We believe the rapid onset of action of vonoprazan may enable on-demand use for the management of GERD-related symptoms as an alternative to chronic daily treatment with PPIs. An on-demand dosing regimen may be especially attractive in NERD, as NERD patients have symptoms related to acid, but do not have esophageal erosions which require chronic treatment for healing. In an open-label, investigator-sponsored clinical trial in Japan in NERD patients, on-demand treatment with vonoprazan was compared to daily treatment with PPIs. Patients utilized approximately 80% fewer doses of vonoprazan compared to PPIs, but demonstrated similar levels of satisfaction.

Takeda conducted two Phase 3 multicenter, randomized, double-blind, parallel group trials with vonoprazan in Japanese patients with endoscopically confirmed NERD. In the first clinical trial, vonoprazan demonstrated a significant reduction in symptom severity versus placebo (p=0.0139), and in the second trial, vonoprazan demonstrated a faster onset of symptom relief versus placebo (p=0.0003). However, the studies did not show a statistically significant difference in the primary endpoint of proportion of days over a 4-week period without heartburn between vonoprazan and placebo (p=0.0504 and p=0.0643). In the first clinical trial, Takeda enrolled patients with symptoms including a three-week history of heartburn or regurgitation with two or more days of heartburn per week, or a three-week history of any acid-reflux symptoms of moderate or higher severity. In the second clinical trial, patients with a three-week history of recurrent heartburn with two or more days of heartburn per week were enrolled. We believe that these results may be due to the selection of patients with a limited history of symptoms, a low threshold for frequency of symptoms of two or more days per week, and with mostly mild to moderate symptoms rather severe symptoms. In contrast, all PPIs approved for NERD in the United States enrolled subjects with greater than six-month history of heartburn and heartburn on at least four of the seven days immediately preceding randomization.

In addition, in a Phase 2 clinical trial in European patients with NERD who were partial responders to high dose PPIs, vonoprazan did not demonstrate superiority versus esomeprazole in the primary endpoint of the percentage of heartburn free days over the four-week treatment period. We believe this result may have been due to inclusion of patients with GI disorders unrelated to acid.

***Other Indications***. Barrett's esophagus and Zollinger Ellison syndrome are severe diseases related to acid secretion where PPIs are the current standard of care. The improved acid control of vonoprazan relative to PPIs may lead to improved results over PPIs.

Eosinophilic esophagitis is an autoimmune disease with significant unmet need. Although not approved for this indication, PPIs are prescribed for the treatment of eosinophilic esophagitis. Vonoprazan demonstrated similar efficacy to PPIs in an investigator-sponsored clinical trial in Japan. In

this clinical trial, 112 patients with eosinophilic esophagitis were treated with vonoprazan, or the PPI rabeprazole or esomeprazole. Of patients treated with vonoprazan, 82% had complete relief of symptoms compared to 70% for esomeprazole and 76-78% for rabeprazole. Similarly, 35% of patients treated with vonoprazan demonstrated complete remission of eosinophilic esophagitis by histology, compared to 37% for esomeprazole and 31-38% for rabeprazole.

***Formulations and Packaging***

***Orally Disintegrating Tablet***. An orally disintegrating tablet, or ODT, formulation for vonoprazan is currently in development by Takeda. We may conduct one or more Phase I trials to support potential approval of the ODT formulation. We believe that the ODT represents a meaningful commercial opportunity for patients with difficulty swallowing, as estimated peak U.S. sales of the lansoprazole ODT formulation were over $450 million.

***Intravenous Formulation***. We are exploring the potential to develop an intravenous formulation of vonoprazan for use in acute bleeding, critically ill patients, or other in-hospital applications. Several PPIs have approved intravenous formulations.

***Pediatric Formulation***. We are exploring the potential to develop an oral formulation, in addition to an ODT formulation, for pediatric use.

***Convenience Pack for H. pylori***. In Japan, vonoprazan is marketed both as a stand-alone medicine as well as in pre-packaged convenience packs with either clarithromycin and amoxicillin (Vonosap) or metronidazole and amoxicillin (Vonopion). Pre-packaged products for the treatment of *H. pylori* infection may improve patient adherence and treatment outcomes, and we believe there is a meaningful market opportunity for such a product. In the United States, PrevPac was formerly marketed as a pre-packaged convenience pack of lansoprazole, clarithromycin, and amoxicillin and achieved peak sales of $150 million.

***Over the Counter Use***

We believe that vonoprazan has the ideal profile for an OTC product, including the potential for on-demand symptom relief and a well-tolerated safety profile. The market for OTC heartburn relief is substantial, with 2018 sales of $3.2 billion in the United States.

**Competition**

The biopharmaceutical industry is characterized by rapidly advancing technologies, intense competition and strong emphasis on proprietary products. We face potential competition from many sources, including major pharmaceutical, specialty pharmaceutical and biotechnology companies, academic institutions and government agencies and public and private research institutions. If vonoprazan receives marketing approval in the United States, Europe or Canada, it will compete with existing therapies and new therapies that may become available in the future.

Some of our competitors, either alone or with their strategic partners, have substantially greater financial, technical and human resources and significantly greater experience in the discovery and development of product candidates, obtaining FDA and other regulatory approvals of treatments and commercializing those treatments. These same competitors may invent technology that competes with vonoprazan. Mergers and acquisitions in the biotechnology and pharmaceutical industries may result in even more resources being concentrated among a smaller number of our competitors. These competitors also compete with us in recruiting and retaining qualified scientific and management personnel and establishing clinical trial sites and subject recruitment for clinical trials, as well as in

acquiring technologies complementary to, or necessary for, our programs. Smaller or early-stage companies may also prove to be significant competitors, particularly through collaborative arrangements with large and established companies.

Our commercial opportunity could be reduced or eliminated if our competitors develop and commercialize products that are more effective, have fewer or less severe side effects, are more convenient or are less expensive than any products that we may develop. Our competitors also may obtain FDA or other regulatory approval for their products more rapidly than we may obtain approval for vonoprazan, which could result in our competitors establishing a strong market position before we are able to enter the market. In addition, we expect that vonoprazan, if approved, will be priced at a premium over competitive generic products and our ability to compete may be affected in many cases by insurers or other third-party payors seeking to encourage the use of generic products.

We expect that vonoprazan, if approved for the treatment of erosive esophagitis and treatment of *H. pylori* infection, will primarily compete with generic PPIs marketed by multiple pharmaceutical companies in both the prescription and OTC markets. Additionally, RedHill Biopharma Ltd. is developing Talicia, a co-formulated capsule comprising generic omeprazole, amoxicillin, and rifabutin for the treatment of *H. pylori* infection, and filed a new drug application, or NDA, in the United States in May 2019. Ironwood Pharmaceuticals, Inc. is developing IW-3718, a bile acid sequestrant, currently in Phase 3 clinical trials as an adjunct to PPIs for the treatment of patients with persistent GERD.

We are also aware of other P-CABs in territories outside of the United States that, if developed and approved in our territories, may compete with vonoprazan. Revaprazan is marketed by Yuhan Corporation in South Korea. Tegoprazan is marketed by CJ Healthcare Corp. in South Korea and is currently in Phase 3 development in Japan by RaQualia Pharma, Inc. Daewoong Pharmaceutical Co., Ltd.'s DWP14012 has been studied in Phase 2 clinical trials in South Korea, and Cinclus Pharma AG's X842 has completed a Phase 1 clinical trial in Europe. To our knowledge, none of these compounds have demonstrated superiority to PPIs on clinical endpoints.

Additionally, we are aware of several clinical-stage PPIs in territories outside of the United States that if developed and approved in our licensed territories may compete with vonoprazan. These include Dexa Medica's DLBS-2411, currently in Phase 3 clinical trials in Indonesia, Sihuan Pharmaceutical's anaprazole, currently in Phase 3 clinical trials in China, Eisai's azeloprazole, currently in a Phase 2 clinical trial in Japan, and Sidem Pharma's tenatoprazole, currently in Phase 2 clinical trials in Europe and Canada.

**Manufacturing**

We do not currently own or operate manufacturing facilities for the production of clinical or commercial quantities of vonoprazan. Vonoprazan is a small molecule that can be manufactured using commercially available technologies. We currently rely on Takeda to supply us with vonoprazan drug product for clinical use. We intend to enter into a commercial supply agreement with Takeda, and we are exploring additional options for commercial supply of vonoprazan from other third party contract manufacturers.

With respect to any future product candidates, we expect to continue to rely on third-party contract manufacturers to manufacture clinical supplies and commercial quantities of any approved product. Although we rely on contract manufacturers, we have personnel with manufacturing experience to oversee our relationship with Takeda.

**Intellectual Property**

Intellectual property, including patents, trade secrets, trademarks and copyrights, is important to our business. Our commercial success depends in part on our ability to obtain and maintain proprietary

intellectual property protection for vonoprazan, as well as for future product candidates and novel discoveries, product development technologies, and know-how. Our commercial success also depends in part on our ability to operate without infringing on the proprietary rights of others and to prevent others from infringing our proprietary rights. Our policy is to develop and maintain protection of our proprietary position by, among other methods, licensing or filing U.S. and foreign patents and applications relating to our technology, inventions, and improvements that are important to the development and implementation of our business.

Our patent portfolio, comprising patents and patent applications exclusively licensed to us, is built with a goal of establishing broad protection that generally includes, for the product candidate compound, claims directed to composition of matter, pharmaceutical compositions or formulations, methods of synthesis, and methods of treatment using such pharmaceutical compositions or formulations. As of September 30, 2019, our patent portfolio covering vonoprazan consists solely of exclusively licensed patents and patent applications from Takeda. Subject to the terms of the license agreement we entered into with Takeda on May 7, 2019, or the Takeda License, we have licensed from Takeda exclusive rights in the United States, Europe, and Canada to patents and patent applications covering the composition of matter, formulation, use and/or manufacture of vonoprazan. Our patent portfolio comprises 11 distinct patent families protecting the technology relating to the compound vonoprazan and its synthetic intermediates, methods of synthesizing vonoprazan and related compounds, various formulations of vonoprazan products, as well as methods of treating diseases with vonoprazan and related compounds. As of September 30, 2019, our portfolio consists of approximately 17 issued U.S. patents, 6 pending U.S. applications, 9 issued European patents subsequently validated in individual European countries, 6 pending European applications, 3 issued Canadian patents, 5 pending Canadian applications, and one pending PCT application. The issued patents and pending applications have nominal expiration dates ranging from 2024 to 2038, without accounting for any available patent term adjustments or extensions. The issued U.S. patent covering the composition of matter of vonoprazan is expected to expire in August 2028, not including patent term extension. The issued U.S. patent covering the formulation of vonoprazan is expected to expire in August 2030, not including patent term extension.

The term of individual patents in our portfolio depends upon the legal term of patents in the countries in which they are obtained. In most countries in which we file, including the United States, the patent term is 20 years from the earliest date of filing a non-provisional patent application. In the United States, the term of a patent may be eligible for patent term adjustment, which permits patent term restoration as compensation for delays incurred at the USPTO during the patent prosecution process. In addition, for patents that cover an FDA-approved drug, the Drug Price Competition and Patent Term Restoration Act of 1984, or the Hatch-Waxman Act, permits a patent term extension of up to five years beyond the expiration of the patent. While the length of the patent term extension is related to the length of time the drug is under regulatory review, patent term extension cannot extend the remaining term of a patent beyond a total of 14 years from the date of product approval, and only one patent per approved drug may be extended under the Hatch-Waxman Act. Similar provisions are available in Europe and other foreign jurisdictions to extend the term of a patent that covers an approved drug. In the future, if and when our products receive FDA approval, we expect to apply for patent term extensions on patents covering those products. We plan to seek any available patent term extension to any issued patents we may be granted in any jurisdiction where such extensions are available; however, there is no guarantee that the applicable authorities, including the FDA in the United States, will agree with our assessment of whether such extensions should be granted, and if granted, the length of such extensions.

The patent positions of companies like ours are generally uncertain and involve complex legal and factual questions. The relevant patent laws and their interpretation outside of the United States is also uncertain. Changes in either the patent laws or their interpretation in the United States and other

countries may diminish our ability to protect our technology or product candidates and could affect the value of such intellectual property. In particular, our ability to stop third parties from making, using, selling, offering to sell or importing products that infringe our intellectual property will depend in part on our success in obtaining and enforcing patent claims that cover our technology, inventions and improvements. We cannot guarantee that patents will be granted with respect to any of our licensed pending patent applications or with respect to any patent applications we may file in the future, nor can we be sure that any patents that may be granted to us or Takeda in the future will be commercially useful in protecting our products, the methods of use or manufacture of those products. Moreover, issued patents do not guarantee the right to practice our technology in relation to the commercialization of our products. Issued patents only allow us to block potential competitors from practicing the claimed inventions of the issued patents.

Further, patents and other intellectual property rights in the pharmaceutical and biotechnology space are evolving and involve many risks and uncertainties. For example, third parties may have blocking patents that could be used to prevent us from commercializing vonoprazan and any future product candidates and practicing our proprietary technology, and any issued patents may be challenged, invalidated or circumvented, which could limit our ability to stop competitors from marketing related products or could limit the term of patent protection that otherwise may exist for vonoprazan and any future product candidates. In addition, the scope of the rights granted under any issued patents may not provide us with protection or competitive advantages against competitors with similar technology. Furthermore, our competitors may independently develop similar technologies that are outside the scope of the rights granted under any issued patents. For these reasons, we may face competition with respect to vonoprazan and any future product candidates. Moreover, because of the extensive time required for development, testing and regulatory review of a potential product, it is possible that, before any particular product candidate can be commercialized, any patent protection for such product may expire or remain in force for only a short period following commercialization, thereby reducing the commercial advantage the patent provides.

It is our policy to require our employees, consultants, outside scientific collaborators, sponsored researchers and other advisors to execute confidentiality agreements upon the commencement of employment or consulting relationships with us, and for employees and consultants to enter into invention assignment agreements with us. These agreements provide that all confidential information developed or made known to the individual during the course of the individual's relationship with us is to be kept confidential and not disclosed to third parties except in specific circumstances. Where applicable, the agreements provide that all inventions to which the individual contributed as an inventor shall be assigned to Phathom, and as such, will become our property. There can be no assurance, however, that these agreements will provide meaningful protection or adequate remedies for our trade secrets in the event of unauthorized use or disclosure of such information.

Further, we have filed for and are pursuing trademark protection for our company name "Phathom Pharmaceuticals" in the United States and foreign jurisdictions.

***License Agreement with Takeda Pharmaceutical Company Limited***

On May 7, 2019, we and Takeda entered into the Takeda License. Pursuant to the Takeda License, Takeda granted us an exclusive, sublicensable (with Takeda's reasonable consent) license under certain patents and know how relating to vonoprazan and owned or controlled by Takeda during the term of the Takeda License to commercialize vonoprazan products using specified formulations for all human therapeutic uses in the United States, Europe and Canada, and a non-exclusive license under such patents and know how to develop and manufacture such vonoprazan products anywhere in the world (subject to Takeda's consent as to each country) for the purposes of commercializing the vonoprazan products in the United States, Europe and Canada. We granted Takeda a non-exclusive,

royalty-free, sublicensable license under our rights in any patents and know-how that are necessary or useful to enable Takeda to develop and manufacture vonoprazan products anywhere in the world for the purposes of commercialization outside United States, Europe and Canada. We also granted Takeda an exclusive, royalty-free license under our rights in certain patents and know-how owned or controlled by us and necessary for the exploitation of vonoprazan products, in each case for Takeda to commercialize any vonoprazan product outside of the United States, Canada, and Europe and for purposes other than human therapeutic use.

During the term of the Takeda License, we and our affiliates are not permitted to commercialize any pharmaceutical product, other than vonoprazan, that treats acid-related disorders, except for certain generic and OTC competing products in specified circumstances. We will be responsible, at our cost, for the development, manufacture and commercialization of the vonoprazan products. We are required to use commercially reasonable efforts to develop and commercialize the vonoprazan products in our licensed territory.

Under the Takeda License, Takeda has the sole right and authority, with our input, to prepare, file, prosecute, and maintain all Takeda and joint patents on a worldwide basis at its own cost. We are responsible, at our cost, for preparing, filing, prosecuting, and maintaining patents on inventions made solely by us in connection with vonoprazan, subject to input from Takeda. We have the first right to enforce the licensed patent rights with respect to certain infringing products in the United States, Europe and Canada.

We paid Takeda upfront consideration consisting of a cash payment of $25.0 million, 1,084,000 shares of common stock and a warrant to purchase 7,588,000 shares of common stock, or the Takeda Warrant. In the event that Takeda's fully-diluted ownership, including the Takeda Warrant, represents less than a certain specified percentage of our fully-diluted capitalization, including shares issuable upon conversion of outstanding convertible promissory notes, calculated immediately prior to the closing of this offering, we further agreed to issue an additional warrant to purchase shares of common stock such that Takeda would hold a certain specified percentage of the fully-diluted capitalization immediately before the closing of this offering. We agreed to make milestone payments to Takeda upon achieving certain tiered aggregate annual net sales of licensed products in the United States, Europe and Canada up a total maximum milestone amount of $250.0 million. We also agreed to make tiered royalty payments in the low double digits to the mid-teens on net sales of licensed products, subject to specified offsets and reductions. Royalties will be payable, on a product-by-product and country-by-country basis from the first commercial sale of such product in such country, until the latest of expiration of the licensed patents covering the applicable product, expiration of regulatory exclusivity in such country, or 15 years following first commercial sale in such country.

The Takeda License will continue until the expiration of the obligation to pay royalties in all countries and on all products. We may terminate the Takeda License in its entirety without cause upon six months' prior written notice. We and Takeda may terminate the Takeda License in the case of the other party's insolvency, or upon prior written notice within a specified time period for the other party's material uncured breach. Takeda may terminate the Takeda License in its entirety if we challenge the licensed patents, or if we assist any third party in challenging such patents.

In connection with the Takeda License, we entered into a clinical manufacturing and supply agreement with Takeda whereby Takeda provides certain quantities of vonoprazan.

**Government Regulation**

Government authorities in the United States, at the federal, state and local level, and other countries extensively regulate, among other things, the research, development, testing, manufacture,

quality control, approval, labeling, packaging, storage, record-keeping, promotion, advertising, distribution, marketing and export and import of products such as those we are developing. A new drug must be approved by the FDA through the NDA process before it may be legally marketed in the United States.

***U.S. Drug Development Process***

In the United States, the FDA regulates drugs under the federal Food, Drug, and Cosmetic Act, or the FDCA, and its implementing regulations. The process of obtaining regulatory approvals and the subsequent compliance with appropriate federal, state, local and foreign statutes and regulations require the expenditure of substantial time and financial resources. Failure to comply with the applicable U.S. requirements at any time during the product development process, approval process or after approval may subject an applicant to administrative or judicial sanctions. These sanctions could include the FDA's refusal to approve pending applications, withdrawal of an approval, a clinical hold, warning letters, product recalls, product seizures, total or partial suspension of production or distribution, injunctions, fines, refusals of government contracts, restitution, disgorgement or civil or criminal penalties. Any agency or judicial enforcement action could have a material adverse effect on us.

The process required by the FDA before a drug may be marketed in the United States generally involves the following:

- completion of preclinical laboratory tests, animal studies and formulation studies in accordance with Good Laboratory Practice, or GLP, regulations and other applicable regulations;
- submission to the FDA of an IND, which must become effective before human clinical trials may begin;
- approval by an independent institutional review board, or IRB, at each clinical site before each trial may be initiated;
- performance of adequate and well-controlled human clinical trials in accordance with Good Clinical Practice, or GCP, regulations to establish the safety and efficacy of the proposed drug for its intended use;
- submission to the FDA of an NDA;
- satisfactory completion of an FDA advisory committee review, if applicable;
- satisfactory completion of an FDA inspection of the manufacturing facility or facilities at which the drug is produced to assess compliance with current GMP, or cGMP, requirements to assure that the facilities, methods and controls are adequate to preserve the drug's identity, strength, quality and purity; and
- FDA review and approval of the NDA to permit commercial marketing of the product for particular indications for use in the United States.

Once a pharmaceutical candidate is identified for development, it enters the preclinical testing stage. Preclinical tests include laboratory evaluations of product chemistry, toxicity and formulation, as well as animal studies. An IND sponsor must submit the results of the preclinical tests, together with manufacturing information and analytical data, to the FDA as part of the IND. An IND is a request for authorization from the FDA to administer an investigational new drug product to humans. The sponsor will also include a protocol detailing, among other things, the objectives of the first phase of the clinical trial, the parameters to be used in monitoring safety, and the effectiveness criteria to be evaluated, if the first phase lends itself to an efficacy evaluation. Some preclinical testing may continue even after the IND is submitted. The IND automatically becomes effective 30 days after receipt by the FDA,

unless the FDA, within the 30-day time period, places the clinical trial on a clinical hold. In such a case, the IND sponsor and the FDA must resolve any outstanding concerns before the clinical trial can begin. Clinical holds also may be imposed by the FDA at any time before or during clinical trials due to safety concerns about on-going or proposed clinical trials or non-compliance with specific FDA requirements, and the trials may not begin or continue until the FDA notifies the sponsor that the hold has been lifted. Submission of an IND therefore may or may not result in FDA authorization to begin a clinical trial.

All clinical trials must be conducted under the supervision of one or more qualified investigators in accordance with GCP regulations, which include the requirement that all research subjects provide their informed consent in writing for their participation in any clinical trial. They must be conducted under protocols detailing, among other things, the objectives of the trial, dosing procedures, subject selection and exclusion criteria and the safety and effectiveness criteria to be evaluated. Each protocol must be submitted to the FDA as part of the IND as well as any subsequent protocol amendments, and timely safety reports must be submitted to the FDA and the investigators for serious and unexpected adverse events. An IRB at each institution participating in the clinical trial must review and approve each protocol before a clinical trial commences at that institution and must also approve the information regarding the trial and the consent form that must be provided to each trial subject or his or her legal representative, monitor the study until completed and otherwise comply with IRB regulations.

Human clinical trials are typically conducted in three sequential phases that may overlap or be combined:

- ***Phase 1***: The product candidate is initially introduced into healthy human volunteers and tested for safety, dosage tolerance, absorption, metabolism, distribution and excretion and, if possible, to gain an early indication of its effectiveness. In the case of some products for severe or life-threatening diseases, such as cancer, especially when the product may be too inherently toxic to ethically administer to healthy volunteers, the initial human testing is often conducted in patients. Sponsors sometimes designate their Phase 1 clinical trials as Phase 1a or Phase 1b. Phase 1b clinical trials are typically aimed at confirming dosing, pharmacokinetics and safety in larger number of patients. Some Phase 1b studies evaluate biomarkers or surrogate markers that may be associated with efficacy in patients with specific types of diseases.
- ***Phase 2***: This phase involves clinical trials in a limited patient population to identify possible adverse effects and safety risks, to preliminarily evaluate the efficacy of the product for specific targeted diseases and to determine dosage tolerance and appropriate dosage.
- ***Phase 3***: Clinical trials are undertaken to further evaluate dosage, clinical efficacy and safety in an expanded patient population, generally at geographically dispersed clinical study sites. These clinical trials are intended to establish the overall risk-benefit ratio of the product candidate and provide, if appropriate, an adequate basis for product labeling.

Post-approval trials, sometimes referred to as Phase 4 studies, may be conducted after initial marketing approval. These trials are used to gain additional experience from the treatment of patients in the intended therapeutic indication. In certain instances, the FDA may mandate the performance of Phase 4 clinical trials as a condition of approval of an NDA.

The FDA or the sponsor may suspend a clinical trial at any time on various grounds, including a finding that the research subjects or patients are being exposed to an unacceptable health risk. Similarly, an IRB can suspend or terminate approval of a clinical trial at its institution if the clinical trial is not being conducted in accordance with the IRB's requirements or if the drug has been associated with unexpected serious harm to patients. In addition, some clinical trials are overseen by an independent group of qualified experts organized by the sponsor, known as a data safety monitoring board or committee. Depending on its charter, this group may determine whether a trial may move forward at designated check points based on access to certain data from the trial.

During the development of a new drug, sponsors are given opportunities to meet with the FDA at certain points. These points may be prior to submission of an IND, at the end of Phase 2, and before an NDA is submitted. Meetings at other times may be requested. These meetings can provide an opportunity for the sponsor to share information about the data gathered to date, for the FDA to provide advice, and for the sponsor and the FDA to reach agreement on the next phase of development. Sponsors typically use the meetings at the end of the Phase 2 trial to discuss Phase 2 clinical results and present plans for the pivotal Phase 3 clinical trials that they believe will support approval of the new drug.

Concurrent with clinical trials, companies usually complete additional animal studies and must also develop additional information about the chemistry and physical characteristics of the drug and finalize a process for manufacturing the product in commercial quantities in accordance with cGMP requirements. The manufacturing process must be capable of consistently producing quality batches of the product candidate and, among other things, the manufacturer must develop methods for testing the identity, strength, quality and purity of the final drug. In addition, appropriate packaging must be selected and tested and stability studies must be conducted to demonstrate that the product candidate does not undergo unacceptable deterioration over its shelf life.

While the IND is active and before approval, progress reports summarizing the results of the clinical trials and nonclinical studies performed since the last progress report must be submitted at least annually to the FDA, and written IND safety reports must be submitted to the FDA and investigators for serious and unexpected suspected adverse events, findings from other studies suggesting a significant risk to humans exposed to the same or similar drugs, findings from animal or *in vitro* testing suggesting a significant risk to humans, and any clinically important increased incidence of a serious suspected adverse reaction compared to that listed in the protocol or investigator brochure.

There are also requirements governing the reporting of ongoing clinical trials and completed trial results to public registries. Sponsors of certain clinical trials of FDA-regulated products are required to register and disclose specified clinical trial information, which is publicly available at www.clinicaltrials.gov. Information related to the product, patient population, phase of investigation, trial sites and investigators and other aspects of the clinical trial is then made public as part of the registration. Sponsors are also obligated to discuss the results of their clinical trials after completion. Disclosure of the results of these trials can be delayed until the new product or new indication being studied has been approved.

***NDA Review and Approval Process***

The results of product development, preclinical and other non-clinical studies and clinical trials, along with descriptions of the manufacturing process, analytical tests conducted on the chemistry of the drug, proposed labeling and other relevant information are submitted to the FDA as part of an NDA requesting approval to market the product. The submission of an NDA is subject to the payment of substantial user fees; a waiver of such fees may be obtained under certain limited circumstances. The FDA reviews an NDA to determine, among other things, whether a product is safe and effective for its intended use and whether its manufacturing is cGMP-compliant to assure and preserve the product's identity, strength, quality and purity. Under the Prescription Drug User Fee Act, or PDUFA, guidelines that are currently in effect, the FDA has a goal of ten months from the date of "filing" of a standard NDA for a new molecular entity to review and act on the submission. This review typically takes twelve months from the date the NDA is submitted to FDA because the FDA has approximately two months to make a "filing" decision after it the application is submitted. The FDA conducts a preliminary review of all NDAs within the first 60 days after submission, before accepting them for filing, to determine whether they are sufficiently complete to permit substantive review The FDA may request additional information rather than accept an NDA for filing. In this event, the NDA must be resubmitted with the

additional information. The resubmitted application also is subject to review before the FDA accepts it for filing.

The FDA may refer an application for a novel drug to an advisory committee. An advisory committee is a panel of independent experts, including clinicians and other scientific experts, that reviews, evaluates and provides a recommendation as to whether the application should be approved and under what conditions. The FDA is not bound by the recommendations of an advisory committee, but it considers such recommendations carefully when making decisions. Before approving an NDA, the FDA will inspect the facility or facilities where the product is manufactured. The FDA will not approve an application unless it determines that the manufacturing processes and facilities are in compliance with cGMP requirements and adequate to assure consistent production of the product within required specifications. Additionally, before approving an NDA, the FDA may inspect one or more clinical trial sites to assure compliance with GCP requirements.

After the FDA evaluates an NDA, it will issue an approval letter or a Complete Response Letter. An approval letter authorizes commercial marketing of the drug with prescribing information for specific indications. A Complete Response Letter indicates that the review cycle of the application is complete and the application will not be approved in its present form. A Complete Response Letter usually describes the specific deficiencies in the NDA identified by the FDA and may require additional clinical data, such as an additional pivotal Phase 3 trial or other significant and time-consuming requirements related to clinical trials, nonclinical studies or manufacturing. If a Complete Response Letter is issued, the sponsor must resubmit the NDA or, addressing all of the deficiencies identified in the letter, or withdraw the application. Even if such data and information are submitted, the FDA may decide that the NDA does not satisfy the criteria for approval.

If a product receives regulatory approval, the approval may be significantly limited to specific diseases and dosages or the indications for use may otherwise be limited, which could restrict the commercial value of the product. In addition, the FDA may require a sponsor to conduct Phase 4 testing, which involves clinical trials designed to further assess a drug's safety and effectiveness after NDA approval, and may require testing and surveillance programs to monitor the safety of approved products which have been commercialized. The FDA may also place other conditions on approval including the requirement for a risk evaluation and mitigation strategy, or REMS, to assure the safe use of the drug. If the FDA concludes a REMS is needed, the sponsor of the NDA must submit a proposed REMS. The FDA will not approve the NDA without an approved REMS, if required. A REMS could include medication guides, physician communication plans or elements to assure safe use, such as restricted distribution methods, patient registries and other risk minimization tools. Any of these limitations on approval or marketing could restrict the commercial promotion, distribution, prescription or dispensing of products. Marketing approval may be withdrawn for non-compliance with regulatory requirements or if problems occur following initial marketing.

The Pediatric Research Equity Act, or PREA, requires a sponsor to conduct pediatric clinical trials for most drugs, for a new active ingredient, new indication, new dosage form, new dosing regimen or new route of administration. Under PREA, original NDAs and supplements must contain a pediatric assessment unless the sponsor has received a deferral or waiver. The required assessment must evaluate the safety and effectiveness of the product for the claimed indications in all relevant pediatric subpopulations and support dosing and administration for each pediatric subpopulation for which the product is safe and effective. The sponsor or FDA may request a deferral of pediatric clinical trials for some or all of the pediatric subpopulations. A deferral may be granted for several reasons, including a finding that the drug is ready for approval for use in adults before pediatric clinical trials are complete or that additional safety or effectiveness data needs to be collected before the pediatric clinical trials begin. The FDA must send a non-compliance letter to any sponsor that fails to submit the required assessment, keep a deferral current or fails to submit a request for approval of a pediatric formulation.

***Expedited Development and Review Programs***

A sponsor may seek approval of its product candidate under programs designed to accelerate FDA's review and approval of new drugs and biological products that meet certain criteria. The FDA has a fast track designation program that is intended to expedite or facilitate the process for reviewing new drug products that meet certain criteria. Specifically, new drugs are eligible for Fast Track designation if they are intended to treat a serious or life-threatening disease or condition and demonstrate the potential to address unmet medical needs for the disease or condition. Unique to a fast track product, the FDA may consider for review sections of the NDA on a rolling basis before the complete application is submitted, if the sponsor provides a schedule for the submission of the sections of the NDA, the FDA agrees to accept sections of the NDA and determines that the schedule is acceptable, and the sponsor pays any required user fees upon submission of the first section of the NDA.

Any product submitted to the FDA for approval, including a product with a fast track designation, may also be eligible for other types of FDA programs intended to expedite development and review, such as priority review and accelerated approval. A product is eligible for priority review if it has the potential to provide safe and effective therapy where no satisfactory alternative therapy exists or a significant improvement in the safety or effectiveness of the treatment, diagnosis or prevention of a serious disease or condition. The FDA will attempt to direct additional resources to the evaluation of an application for a new drug designated for priority review in an effort to facilitate the review. The FDA endeavors to review applications with priority review designations within six months of the filing date as compared to ten months for review of new molecular entity NDAs under its current PDUFA review goals. Priority review designation does not change the scientific/medical standard for approval or the quality of evidence necessary to support approval.

In addition, a product may be eligible for accelerated approval. Drug products intended to treat serious or life-threatening diseases or conditions may be eligible for accelerated approval upon a determination that the product has an effect on a surrogate endpoint that is reasonably likely to predict clinical benefit, or on a clinical endpoint that can be measured earlier than irreversible morbidity or mortality, that is reasonably likely to predict an effect on irreversible morbidity or mortality or other clinical benefit, taking into account the severity, rarity, or prevalence of the condition and the availability or lack of alternative treatments. As a condition of approval, the FDA may require that a sponsor of a drug receiving accelerated approval perform adequate and well-controlled post-marketing clinical trials. In addition, the FDA currently requires as a condition for accelerated approval pre-approval of promotional materials, which could adversely impact the timing of the commercial launch of the product. FDA may withdraw approval of a drug or indication approved under accelerated approval if, for example, the confirmatory trial fails to verify the predicted clinical benefit of the product.

The FDA can also designate a drug as a "breakthrough therapy." A sponsor may seek FDA designation of a product candidate as a "breakthrough therapy" if the product is intended, alone or in combination with one or more other products, to treat a serious or life-threatening disease or condition and preliminary clinical evidence indicates that the product may demonstrate substantial improvement over existing therapies on one or more clinically significant endpoints, such as substantial treatment effects observed early in clinical development. If the FDA designates a breakthrough therapy, it may take actions appropriate to expedite the development and review of the application, which may include holding meetings with the sponsor and the review team throughout the development of the therapy; providing timely advice to, and interactive communication with, the sponsor regarding the development of the drug to ensure that the development program to gather the nonclinical and clinical data necessary for approval is as efficient as practicable; involving senior managers and experienced review staff, as appropriate, in a collaborative, cross-disciplinary review; assigning a cross-disciplinary project lead for the FDA review team to facilitate an efficient review of the development program and to

serve as a scientific liaison between the review team and the sponsor; and considering alternative clinical trial designs when scientifically appropriate, which may result in smaller trials or more efficient trials that require less time to complete and may minimize the number of patients exposed to a potentially less efficacious treatment. The designation includes all of the fast track program features, which means that the sponsor may file sections of the NDA for review on a rolling basis if certain conditions are satisfied, including an agreement with FDA on the proposed schedule for submission of portions of the application and the payment of applicable user fees before the FDA may initiate a review. The breakthrough therapy designation is a distinct status from both accelerated approval and priority review, which can also be granted to the same drug if relevant criteria are met. If a product is designated as breakthrough therapy, the FDA will work to expedite the development and review of such drug.

Fast track designation, priority review and breakthrough therapy designation do not change the standards for approval but may expedite the development or approval process. Even if a product qualifies for one or more of these programs, the FDA may later decide that the product no longer meets the conditions for qualification or decide that the time period for FDA review or approval will not be shortened. We may explore some of these opportunities for vonoprazan and any future product candidates as appropriate.

***Post-Approval Requirements***

Once an approval is granted, the FDA may withdraw the approval if compliance with regulatory standards is not maintained or if problems occur after the product reaches the market. Later discovery of previously unknown problems with a product may result in restrictions on the product or even complete withdrawal of the product from the market. After approval, some types of changes to the approved product, such as adding new indications, certain manufacturing changes and additional labeling claims, are subject to further FDA review and approval. Drug manufacturers and other entities involved in the manufacture and distribution of approved drugs are required to register their establishments with the FDA and certain state agencies, and are subject to periodic unannounced inspections by the FDA and certain state agencies for compliance with cGMP regulations and other laws and regulations. In addition, the FDA may impose a number of post-approval requirements as a condition of approval of an NDA. For example, the FDA may require post-marketing testing, including Phase 4 clinical trials, and surveillance to further assess and monitor the product's safety and effectiveness after commercialization.

Any drug products manufactured or distributed by us or our partners pursuant to FDA approvals will be subject to pervasive and continuing regulation by the FDA, including, among other things, record-keeping requirements, reporting of adverse experiences with the drug, providing the FDA with updated safety and efficacy information, drug sampling and distribution requirements, complying with certain electronic records and signature requirements, and complying with FDA promotion and advertising requirements. The FDA strictly regulates labeling, advertising, promotion and other types of information on products that are placed on the market and imposes requirements and restrictions on drug manufacturers, such as those related to direct-to-consumer advertising, the prohibition on promoting products for uses or in patient populations that are not described in the product's approved labeling (known as "off-label use"), industry-sponsored scientific and educational activities, and promotional activities involving the internet.

Discovery of previously unknown problems or the failure to comply with the applicable regulatory requirements may result in restrictions on the marketing of a product or withdrawal of the product from the market as well as possible civil or criminal sanctions. Failure to comply with the applicable U.S. requirements at any time during the product development process, approval process or after approval, may subject an applicant or manufacturer to administrative or judicial civil or criminal sanctions and

adverse publicity. FDA sanctions could include refusal to approve pending applications, withdrawal of an approval, clinical holds on post-approval clinical trials, warning or untitled letters, product recalls, product seizures, total or partial suspension of production or distribution, injunctions, fines, refusals of government contracts, mandated corrective advertising or communications with doctors, debarment, restitution, disgorgement of profits, or civil or criminal penalties.

***Marketing Exclusivity***

Market exclusivity provisions under the FDCA can delay the submission or the approval of certain marketing applications. The FDCA provides a five-year period of non-patent marketing exclusivity within the United States to the first applicant to obtain approval of an NDA for a new chemical entity. A drug is a new chemical entity if the FDA has not previously approved any other new drug containing the same active moiety, which is the molecule or ion responsible for the action of the drug substance. During the exclusivity period, the FDA may not approve or even accept for review an abbreviated new drug application, or ANDA, or an NDA submitted under Section 505(b)(2), or 505(b)(2) NDA, submitted by another company for another drug based on the same active moiety, regardless of whether the drug is intended for the same indication as the original innovative drug or for another indication, where the applicant does not own or have a legal right of reference to all the data required for approval. However, an application may be submitted after four years if it contains a certification of patent invalidity or non-infringement to one of the patents listed with the FDA by the innovator NDA holder.

The FDCA alternatively provides three years of marketing exclusivity for an NDA, or supplement to an existing NDA if new clinical investigations, other than bioavailability studies, that were conducted or sponsored by the applicant are deemed by the FDA to be essential to the approval of the application, for example new indications, dosages or strengths of an existing drug. This three-year exclusivity covers only the modification for which the drug received approval on the basis of the new clinical investigations and does not prohibit the FDA from approving ANDAs or 505(b)(2) NDAs for drugs containing the active agent for the original indication or condition of use. Five-year and three-year exclusivity will not delay the submission or approval of a full NDA. However, an applicant submitting a full NDA would be required to conduct or obtain a right of reference to all of the preclinical studies and adequate and well-controlled clinical trials necessary to demonstrate safety and effectiveness.

Pediatric exclusivity is another type of marketing exclusivity available in the United States. Pediatric exclusivity provides for an additional six months of marketing exclusivity attached to another period of exclusivity if a sponsor conducts clinical trials in children in response to a written request from the FDA. The issuance of a written request does not require the sponsor to undertake the described clinical trials.

Additionally, under the GAIN Act, the FDA may designate a product as a “qualified infectious disease product,” or QIDP. In order to receive this designation, a drug must qualify as an antibacterial or antifungal drug for human use intended to treat serious or life-threatening infections, including those caused by either (1) an antibacterial or antifungal resistant pathogen, including novel or emerging infectious pathogens, or (2) a so-called “qualifying pathogen” found on a list of potentially dangerous, drug-resistant organisms established and maintained by the FDA under the law. A sponsor must request such designation before submitting a marketing application. FDA granted QIDP designation for vonoprazan for the treatment of *H. pylori* infection in combination with both amoxicillin and clarithromycin, and with amoxicillin alone, respectively.

The benefits of QIDP designation include potential eligibility for priority review and fast track designation, and an extension by an additional five years of any non-patent marketing exclusivity period awarded, such as a five-year exclusivity period awarded for a new molecular entity. This

extension is in addition to any pediatric exclusivity extension that may be awarded, and the extension will be awarded only to a drug first approved on or after the date of enactment. The GAIN Act provisions prohibit the grant of an exclusivity extension where the application is a supplement to an application for which an extension is in effect or has expired, is a subsequent application for a specified change to an approved product, or is an application for a product that does not meet the definition of QIDP based on the uses for which it is ultimately approved.

***U.S. Healthcare Fraud and Abuse Laws and Compliance Requirements***

In addition to FDA regulation of pharmaceutical products, U.S. federal and state healthcare laws and regulations restrict business practices in the pharmaceutical industry. These laws may impact, among other things, our current and future business operations, including our clinical research activities, and constrain the business or financial arrangements and relationships with healthcare providers and other parties. These laws include anti-kickback and false claims laws, civil monetary penalties laws, data privacy and security laws, and physician payment transparency laws. In addition to the federal laws summarized below, we may also be subject to similar state and local laws and regulations that may apply to business practices, including but not limited to, research, distribution, sales and marketing arrangements and claims involving healthcare items or services reimbursed by non-governmental third-party payors, including private insurers, or by patients themselves.

The federal Anti-Kickback Statute prohibits, among other things, individuals or entities from knowingly and willfully offering, paying, soliciting or receiving remuneration, directly or indirectly, overtly or covertly, in cash or in kind to induce or in return for purchasing, leasing, ordering or arranging for or recommending the purchase, lease or order of any item or service reimbursable under Medicare, Medicaid or other federal healthcare programs. A person or entity does not need to have actual knowledge of this statute or specific intent to violate it in order to have committed a violation. In addition, the government may assert that a claim including items or services resulting from a violation of the federal Anti-Kickback Statute constitutes a false or fraudulent claim for purposes of the civil False Claims Act and the civil monetary penalties statute.

The federal civil and criminal false claims laws, including the civil False Claims Act, and civil monetary penalties laws prohibit, among other things, any individual or entity from knowingly presenting, or causing to be presented, a false claim for payment to the federal government, knowingly making, using or causing to be made or used a false record or statement material to a false or fraudulent claim to the federal government, or from knowingly making a false statement to avoid, decrease or conceal an obligation to pay money to the federal government.

The federal Health Insurance Portability and Accountability Act of 1996, or HIPAA, created additional federal criminal statutes that prohibit, among other things, knowingly and willfully executing a scheme to defraud any healthcare benefit program, including private third-party payors and knowingly and willfully falsifying, concealing or covering up a material fact or making any materially false, fictitious or fraudulent statement in connection with the delivery of or payment for healthcare benefits, items or services. Similar to the U.S. federal Anti-Kickback Statute, a person or entity does not need to have actual knowledge of the healthcare fraud statute implemented under HIPAA or specific intent to violate it in order to have committed a violation.

In addition, HIPAA, as amended by the Health Information Technology for Economic and Clinical Health Act, and their implementing regulations, imposes certain requirements relating to the privacy, security and transmission of protected health information on HIPAA covered entities, which include certain healthcare providers, health plans and healthcare clearinghouses, and their business associates who conduct certain activities for or on their behalf involving protected health information on their behalf.

The federal Physician Payments Sunshine Act requires certain manufacturers of drugs, devices, biologics and medical supplies for which payment is available under Medicare, Medicaid or the Children's Health Insurance Program, with specific exceptions, to report annually to the Centers for Medicare & Medicaid Services, or CMS, information related to payments or other transfers of value made to physicians and teaching hospitals, and applicable manufacturers and applicable group purchasing organizations to report annually to CMS ownership and investment interests held by physicians and their immediate family members.

Similar state and local laws and regulations may also restrict business practices in the pharmaceutical industry, such as state anti-kickback and false claims laws, which may apply to business practices, including but not limited to, research, distribution, sales and marketing arrangements and claims involving healthcare items or services reimbursed by non-governmental third-party payors, including private insurers, or by patients themselves; state laws that require pharmaceutical companies to comply with the pharmaceutical industry's voluntary compliance guidelines and the relevant compliance guidance promulgated by the federal government, or otherwise restrict payments that may be made to healthcare providers and other potential referral sources; state laws and regulations that require drug manufacturers to file reports relating to pricing and marketing information or which require tracking gifts and other remuneration and items of value provided to physicians, other healthcare providers and entities; state and local laws that require the registration of pharmaceutical sales representatives; and state and local laws governing the privacy and security of health information in some circumstances, many of which differ from each other in significant ways and often are not preempted by HIPAA, thus complicating compliance efforts.

Violation of any of such laws or any other governmental regulations that apply may result in significant criminal, civil and administrative penalties including damages, fines, imprisonment, disgorgement, additional reporting requirements and oversight if we become subject to a corporate integrity agreement or similar agreement to resolve allegations of non-compliance with these laws, contractual damages, reputational harm, diminished profits and future earnings, disgorgement, exclusion from participation in government healthcare programs and the curtailment or restructuring of our operations.

***U.S. Coverage and Reimbursement***

Significant uncertainty exists as to the coverage and reimbursement status of any product candidate for which we may seek regulatory approval. Sales in the United States will depend, in part, on the availability of sufficient coverage and adequate reimbursement from third-party payors, which include government health programs such as Medicare, Medicaid, TRICARE and the Veterans Administration, as well as managed care organizations and private health insurers. Prices at which we or our customers seek reimbursement for vonoprazan and any future product candidates can be subject to challenge, reduction or denial by third-party payors.

The process for determining whether a third-party payor will provide coverage for a product is typically separate from the process for setting the reimbursement rate that the payor will pay for the product. In the United States, there is no uniform policy among payors for coverage or reimbursement. Decisions regarding whether to cover any of a product, the extent of coverage and amount of reimbursement to be provided are made on a plan-by-plan basis. Third-party payors often rely upon Medicare coverage policy and payment limitations in setting their own coverage and reimbursement policies, but also have their own methods and approval processes. Therefore, coverage and reimbursement for products can differ significantly from payor to payor. As a result, the coverage determination process is often a time-consuming and costly process that can require manufacturers to provide scientific and clinical support for the use of a product to each payor separately, with no assurance that coverage and adequate reimbursement will be applied consistently or obtained in the first instance.

Third-party payors are increasingly challenging the price and examining the medical necessity and cost-effectiveness of medical products and services, in addition to their safety and efficacy. Adoption of price controls and cost-containment measures, and adoption of more restrictive policies in jurisdictions with existing controls and measures, could further limit sales of any product that receives approval. Third-party payors may not consider vonoprazan and any future product candidates to be medically necessary or cost-effective compared to other available therapies, or the rebate percentages required to secure favorable coverage may not yield an adequate margin over cost or may not enable us to maintain price levels sufficient to realize an appropriate return on our investment in drug development. Additionally, decreases in third-party reimbursement for any product or a decision by a third-party payor not to cover a product could reduce physician usage and patient demand for the product.

***U.S. Healthcare Reform***

In the United States, there has been, and continues to be, several legislative and regulatory changes and proposed changes regarding the healthcare system that could prevent or delay marketing approval of product candidates, restrict or regulate post-approval activities, and affect the profitable sale of product candidates.

Among policy makers and payors in the United States, there is significant interest in promoting changes in healthcare systems with the stated goals of containing healthcare costs, improving quality and/or expanding access. In the United States, the pharmaceutical industry has been a particular focus of these efforts and has been significantly affected by major legislative initiatives. In March 2010, the Patient Protection and Affordable Care Act, or the Affordable Care Act, was passed, which substantially changed the way healthcare is financed by both governmental and private insurers, and significantly affected the pharmaceutical industry. The Affordable Care Act, increased the minimum level of Medicaid rebates payable by manufacturers of brand name drugs from 15.1% to 23.1%; required collection of rebates for drugs paid by Medicaid managed care organizations; required manufacturers to participate in a coverage gap discount program, in which manufacturers must agree to offer point-of-sale discounts off negotiated prices of applicable brand drugs to eligible beneficiaries during their coverage gap period, as a condition for the manufacturer's outpatient drugs to be covered under Medicare Part D; imposed a non-deductible annual fee on pharmaceutical manufacturers or importers who sell certain "branded prescription drugs" to specified federal government programs, implemented a new methodology by which rebates owed by manufacturers under the Medicaid Drug Rebate Program are calculated for drugs that are inhaled, infused, instilled, implanted, or injected; expanded eligibility criteria for Medicaid programs; creates a new Patient-Centered Outcomes Research Institute to oversee, identify priorities in, and conduct comparative clinical effectiveness research, along with funding for such research; and established a Center for Medicare Innovation at the CMS to test innovative payment and service delivery models to lower Medicare and Medicaid spending, potentially including prescription drug spending.

Since its enactment, there have been judicial and political challenges to certain aspects of the Affordable Care Act. For example, the Tax Cuts and Jobs Act of 2017, or Tax Act, includes a provision repealing, effective January 1, 2019, the tax-based shared responsibility payment imposed by the Affordable Care Act, on certain individuals who fail to maintain qualifying health coverage for all or part of a year that is commonly referred to as the "individual mandate." On December 14, 2018, a U.S. District Court Judge in the Northern District of Texas, or the Texas District Court Judge, ruled that the individual mandate is a critical and inseverable feature of the Affordable Care Act, and therefore, because it was repealed as part of the Tax Act, the remaining provisions of the Affordable Care Act, are invalid as well. While the Texas District Court Judge, as well as the Trump Administration and CMS, have stated that the ruling will have no immediate effect, and on December 30, 2018 the Texas District Court Judge issued an order staying the judgment pending appeal, it is unclear how this

decision, subsequent appeals, and other efforts to repeal and replace the Affordable Care Act, will impact the Affordable Care Act.

In addition, other legislative changes have been proposed and adopted since the Affordable Care Act was enacted. These changes included aggregate reductions to Medicare payments to providers of 2% per fiscal year, which went into effect on April 1, 2013 and, due to subsequent legislative amendments to the statute, including the Bipartisan Budget Act of 2018, will remain in effect through 2027 unless additional Congressional action is taken. On January 2, 2013, the American Taxpayer Relief Act of 2012 was signed into law, which, among other things, reduced Medicare payments to several providers, including hospitals, and increased the statute of limitations period for the government to recover overpayments to providers from three to five years.

Moreover, there has recently been heightened governmental scrutiny over the manner in which manufacturers set prices for their marketed products, which has resulted in several Congressional inquiries and proposed and enacted federal and state legislation designed to, among other things, bring more transparency to product pricing, review the relationship between pricing and manufacturer patient programs, and reform government program reimbursement methodologies for pharmaceutical products. Further, the Trump Administration released a "Blueprint" to lower drug prices and reduce out of pocket costs of drugs that contains additional proposals to increase manufacturer competition, increase the negotiating power of certain federal healthcare programs, incentivize manufacturers to lower the list price of their products and reduce the out of pocket costs of pharmaceutical products paid by consumers. Individual states in the United States have also become increasingly active in implementing regulations designed to control pharmaceutical product pricing, including price or patient reimbursement constraints, discounts, restrictions on certain product access and marketing cost disclosure and transparency measures, and, in some cases, designed to encourage importation from other countries and bulk purchasing. In addition, regional healthcare authorities and individual hospitals are increasingly using bidding procedures to determine which drugs and suppliers will be included in their healthcare programs Furthermore, there has been increased interest by third party payors and governmental authorities in reference pricing systems and publication of discounts and list prices.

***Foreign Regulation***

In order to market any product outside of the United States, we would need to comply with numerous and varying regulatory requirements of other countries and jurisdictions regarding quality, safety and efficacy and governing, among other things, clinical trials, marketing authorization, commercial sales and distribution of our products. Whether or not we obtain FDA approval for a product, we would need to obtain the necessary approvals by the comparable foreign regulatory authorities before we can commence clinical trials or marketing of the product in foreign countries and jurisdictions. Although many of the issues discussed above with respect to the United States apply similarly in the context of the European Union, or EU, the approval process varies between countries and jurisdictions and can involve additional product testing and additional administrative review periods. The time required to obtain approval in other countries and jurisdictions might differ from and be longer than that required to obtain FDA approval. Regulatory approval in one country or jurisdiction does not ensure regulatory approval in another, but a failure or delay in obtaining regulatory approval in one country or jurisdiction may negatively impact the regulatory process in others.

To market a medicinal product in the European Economic Area, or EEA (which is comprised of the 28 Member States of the EU plus Norway, Iceland and Liechtenstein), we must obtain a Marketing Authorization, or MA. There are two types of marketing authorizations:

- the Community MA, which is issued by the European Commission through the Centralized Procedure, based on the opinion of the Committee for Medicinal Products for Human Use of

the EMA and which is valid throughout the entire territory of the EEA. The Centralized Procedure is mandatory for certain types of products, such as biotechnology medicinal products, orphan medicinal products, advanced therapy products, and medicinal products containing a new active substance indicated for the treatment certain diseases, such as AIDS, cancer, neurodegenerative disorders, diabetes, auto-immune and viral diseases. The Centralized Procedure is optional for products containing a new active substance not yet authorized in the EEA, or for products that constitute a significant therapeutic, scientific or technical innovation or which are in the interest of public health in the EU; and

- National MAs, which are issued by the competent authorities of the Member States of the EEA and only cover their respective territory, are available for products not falling within the mandatory scope of the Centralized Procedure. Where a product has already been authorized for marketing in a Member State of the EEA, this National MA can be recognized in another Member State through the Mutual Recognition Procedure. If the product has not received a National MA in any Member State at the time of application, it can be approved simultaneously in various Member States through the Decentralized Procedure.

Under the above described procedures, before granting the MA, the EMA or the competent authorities of the Member States of the EEA make an assessment of the risk-benefit balance of the product on the basis of scientific criteria concerning its quality, safety and efficacy.

*Data and marketing exclusivity*

In the EEA, new products authorized for marketing, or reference products, qualify for eight years of data exclusivity and an additional two years of market exclusivity upon marketing authorization. The data exclusivity period prevents generic or biosimilar applicants from relying on the pre-clinical and clinical trial data contained in the dossier of the reference product when applying for a generic or biosimilar marketing authorization in the EU during a period of eight years from the date on which the reference product was first authorized in the EU. The market exclusivity period prevents a successful generic or biosimilar applicant from commercializing its product in the EU until 10 years have elapsed from the initial authorization of the reference product in the EU. The 10-year market exclusivity period can be extended to a maximum of eleven years if, during the first eight years of those 10 years, the marketing authorization holder obtains an authorization for one or more new therapeutic indications which, during the scientific evaluation prior to their authorization, are held to bring a significant clinical benefit in comparison with existing therapies.

*Pediatric investigation plan*

In the EEA, marketing authorization applications for new medicinal products not authorized have to include the results of studies conducted in the pediatric population, in compliance with a pediatric investigation plan, or PIP, agreed with the EMA's Pediatric Committee, or PDCO. The PIP sets out the timing and measures proposed to generate data to support a pediatric indication of the drug for which marketing authorization is being sought. The PDCO can grant a deferral of the obligation to implement some or all of the measures of the PIP until there are sufficient data to demonstrate the efficacy and safety of the product in adults. Further, the obligation to provide pediatric clinical trial data can be waived by the PDCO when these data is not needed or appropriate because the product is likely to be ineffective or unsafe in children, the disease or condition for which the product is intended occurs only in adult populations, or when the product does not represent a significant therapeutic benefit over existing treatments for pediatric patients. Once the marketing authorization is obtained in all Member States of the EU and study results are included in the product information, even when negative, the product is eligible for six months' supplementary protection certificate extension.

*Clinical trials*

Clinical trials of medicinal products in the European Union must be conducted in accordance with European Union and national regulations and the International Conference on Harmonization, or ICH, guidelines on GCPs. Additional GCP guidelines from the European Commission, focusing in particular on traceability, apply to clinical trials of advanced therapy medicinal products. If the sponsor of the clinical trial is not established within the European Union, it must appoint an entity within the European Union to act as its legal representative. The sponsor must take out a clinical trial insurance policy, and in most EU countries, the sponsor is liable to provide 'no fault' compensation to any study subject injured in the clinical trial.

Prior to commencing a clinical trial, the sponsor must obtain a clinical trial authorization from the competent authority, and a positive opinion from an independent ethics committee. The application for a clinical trial authorization must include, among other things, a copy of the trial protocol and an investigational medicinal product dossier containing information about the manufacture and quality of the medicinal product under investigation. Currently, clinical trial authorization applications must be submitted to the competent authority in each EU Member State in which the trial will be conducted. Under the new Regulation on Clinical Trials, which is currently expected to take effect in 2019, there will be a centralized application procedure where one national authority takes the lead in reviewing the application and the other national authorities have only a limited involvement. Any substantial changes to the trial protocol or other information submitted with the clinical trial applications must be notified to or approved by the relevant competent authorities and ethics committees. Medicines used in clinical trials must be manufactured in accordance with cGMP. Other national and European Union-wide regulatory requirements also apply.

*Privacy and data protection laws*

We are also subject to laws and regulations in non-U.S. countries covering data privacy and the protection of health-related and other personal information. EU member states and other jurisdictions have adopted data protection laws and regulations, which impose significant compliance obligations. Laws and regulations in these jurisdictions apply broadly to the collection, use, storage, disclosure, processing and security of personal information that identifies or may be used to identify an individual, such as names, contact information, and sensitive personal data such as health data. These laws and regulations are subject to frequent revisions and differing interpretations, and have generally become more stringent over time.

As of May 25, 2018, Regulation 2016/676, known as the General Data Protection Regulation, or GDPR, replaced the Data Protection Directive with respect to the processing of personal data in the European Union. The GDPR imposes many requirements for controllers and processors of personal data, including, for example, higher standards for obtaining consent from individuals to process their personal data, more robust disclosures to individuals and a strengthened individual data rights regime, shortened timelines for data breach notifications, limitations on retention and secondary use of information, increased requirements pertaining to health data and pseudonymised (i.e., key-coded) data and additional obligations when we contract third-party processors in connection with the processing of the personal data. The GDPR allows EU member states to make additional laws and regulations further limiting the processing of genetic, biometric or health data. Failure to comply with the requirements of GDPR and the applicable national data protection laws of the EU member states may result in fines of up to €20,000,000 or up to 4% of the total worldwide annual turnover of the preceding financial year, whichever is higher, and other administrative penalties.

**Employees**

As of September 30, 2019, we had 16 full-time employees, 3 of whom have a Ph.D. or M.D. None of our employees are represented by labor unions or covered by collective bargaining agreements. We consider our relationship with our employees to be good.

**Legal Proceedings**

We are not currently subject to any material legal proceedings. From time to time, we may be involved in legal proceedings or subject to claims incident to the ordinary course of business. Regardless of the outcome, such proceedings or claims can have an adverse impact on us because of defense and settlement costs, diversion of resources and other factors, and there can be no assurances that favorable outcomes will be obtained.

# MANAGEMENT

## Executive Officers and Directors

The following table sets forth the name, age and position of each of our executive officers and directors as of September 30, 2019.

| Name | Age | Position |
|---|---|---|
| ***Executive Officers*** | | |
| David Socks | 45 | President, Chief Executive Officer, Treasurer, Secretary and Director |
| Azmi Nabulsi, M.D., M.P.H. | 60 | Chief Operating Officer |
| Aditya Kohli, Ph.D. | 31 | Chief Business Officer |
| ***Non-Employee Directors*** | | |
| Tadataka Yamada, M.D.[(1)(3)] | 74 | Chairman |
| Michael F. Cola[(1)(2)] | 60 | Director |
| Terrie Curran | 50 | Director |
| Jonathan Edwards, Ph.D.[(1)(3)] | 35 | Director |
| Heidi Kunz[(2)] | 64 | Director |
| Chris Slavinsky[(2)] | 47 | Director |
| James Topper, M.D., Ph.D.[(1)(3)] | 57 | Director |

(1) Member of the compensation committee
(2) Member of the audit committee
(3) Member of the nominating and corporate governance committee

### *Executive Officers*

*David Socks* is our co-founder and has served as our Chief Executive Officer, Treasurer and Secretary, and as a member of our board of directors since January 2018, and as our President since March 2019. As part of a planned transition, Terrie Curran, a member of our board of directors, will succeed Mr. Socks as Chief Executive Officer effective upon the closing of the acquisition of her current employer, Celgene Corporation, by Bristol-Myers Squibb Company. Following Ms. Curran's appointment as CEO, Mr. Socks will serve as interim Chief Financial Officer and continue to serve as a member of our board of directors. Since August 2014, Mr. Socks has been a Venture Partner at Frazier Healthcare Partners, or Frazier, a venture capital firm. In this capacity, he co-founded Arcutis, Inc., Nexcida Therapeutics, Inc., Outpost Medicine, LLC, Passage Bio, Inc., Recida Therapeutics, Inc., and Scout Bio, Inc. Mr. Socks served as Chief Executive Officer of Nexcida Therapeutics, Outpost Medicine and Scout Bio. Mr. Socks also serves as Executive Chairman of the board of directors of Recida Therapeutics and as a board member of Outpost Medicine. Prior to joining Frazier, Mr. Socks co-founded Incline Therapeutics, Inc. in 2010 and served as its President and Chief Operating Officer from 2010 until its sale to The Medicines Company in 2013. He also co-founded Cadence Pharmaceuticals, Inc. in 2004 and served as its Vice President of Business Development and then as its Senior Vice President, Corporate Development and Strategy from 2004 until 2010. From 2000 to 2004, Mr. Socks was a Venture Partner at Windamere Venture Partners, a venture capital firm founding and investing in early stage life science companies, where he co-founded several biopharmaceutical companies including Avera Pharmaceuticals, Inc. and Kanisa Pharmaceuticals, Inc. Previously, he worked at Neurocrine Biosciences, EFO Holdings, L.P., an investment firm, and Kaiser Associates, Inc., a strategic management consulting firm. Mr. Socks holds a B.S. from Georgetown University and an M.B.A. from Stanford University. Mr. Socks' knowledge of our business and significant experience as a biopharmaceutical executive and board member, contributed to our board of directors' conclusion that he should serve as a director of our company.

*Azmi Nabulsi, M.D., M.P.H.* is our co-founder and has served as our Chief Operating Officer since March 2019. Dr. Nabulsi has been an entrepreneur-in-residence at Frazier since October 2018. Also,

since January 2019, Dr. Nabulsi has served as a business and clinical advisor to Saama Technologies, Inc., a clinical data and analytics company. Previously, through October 2018, Dr. Nabulsi spent fourteen years at Takeda. Dr. Nabulsi held a number of leadership positions at Takeda, most recently as the Deputy Chief Medical & Scientific Officer and Head of Global Development from 2014 until October 2018. In his roles at Takeda, Dr. Nabulsi oversaw global drug development for both early and late stage product candidates and led global medical, analytic and operational functions responsible for bringing new medicines in multiple therapeutic areas to many markets. Prior to joining Takeda, Dr. Nabulsi held numerous positions at Abbott Laboratories, including Head of Immunology and Oncology Ventures from 1998 to 2002. Dr. Nabulsi has an M.D. from Ain-Shams University in Cairo and a M.P.H. from the University of Minnesota.

*Aditya Kohli, Ph.D.* is our co-founder and has served as our Chief Business Officer since March 2019. Since January 2018, Dr. Kohli has served as Vice President of Frazier. From September 2016 to December 2017, Dr. Kohli served as Senior Associate of Frazier. In this capacity, he has co-founded Passage Bio, Scout Bio, and Recida Therapeutics, Inc., and also served as VP, Business Development and serves on the board of directors of Scout Bio. Prior to joining Frazier, Dr. Kohli worked at McKinsey & Company as an Engagement Manager from June 2016 until September 2016 and as an Associate from September 2014 until May 2016, where he consulted with biopharmaceutical companies on business development, research and development, and marketing and sales strategy. Dr. Kohli received his Ph.D. from the UC Berkeley and UC San Francisco joint graduate program in bioengineering and holds B.S. and M.Eng. degrees in biological engineering from the Massachusetts Institute of Technology.

***Non-Employee Directors***

*Tadataka Yamada, M.D.* has served as Chairman of our board of directors since March 2019. Dr. Yamada currently serves as a Venture Partner on the Life Sciences team of Frazier. From June 2011 to June 2015, Dr. Yamada served as the Chief Medical and Scientific Officer and as a member of the board of directors of Takeda. Dr. Yamada has served since 2011 as a member of the board of directors of Agilent Technologies, a global scientific instrument manufacturing and clinical diagnostics company listed on the New York Stock Exchange. Since June 2016, Dr. Yamada has served on the board of directors of CSL Limited, a biotechnology company that is publicly traded on the Australian Securities Exchange. Dr. Yamada previously served as President of the Global Health Program of the Bill & Melinda Gates Foundation from June 2006 to June 2011. From 2000 to 2006, Dr. Yamada was Chairman of Research and Development and a member of the board of directors of GlaxoSmithKline Inc. and prior to that, he held research and development positions at SmithKline Beecham. Prior to joining SmithKline Beecham, Dr. Yamada was Chairman of the Department of Internal Medicine at the University of Michigan Medical School and Physician-in-Chief of the University of Michigan Medical Center. Dr. Yamada serves as chair of the board of directors at the Clinton Health Access Initiative and a member of the National Academy of Medicine. He is also a Fellow of the Imperial College of Medicine, a Master of the American College of Physicians, a Fellow of the Royal College of Physicians, a Member of the American Academy of Arts and Sciences and a past-President of the American Gastroenterological Association and the Association of American Physicians. Dr. Yamada received his M.D. from New York University School of Medicine and a B.A. in History from Stanford University. He has authored over 150 manuscripts in peer reviewed journals and is the editor of The Textbook of Gastroenterology. He has been the recipient of numerous awards including the Distinguished Achievement Award in Gastrointestinal Physiology from the American Physiological Society, the Friedenwald Medal from the American Gastroenterological Association, and the Watanabe Prize in Translational Research from Indiana University and Eli Lilly & Co. Dr. Yamada's extensive research and experience in gastrointestinal drug development, particularly his involvement in the development of vonoprazan at Takeda, as well as his service as a director or officer of other healthcare companies, contributed to our board of directors' conclusion that he should serve as Chairman of our board of directors.

*Michael F. Cola* has served as a member of our board of directors since September 2019. Mr. Cola has served as Chief Executive Officer and President of Aevi Genomic Medicine, Inc. since September 2013. Mr. Cola served as President of Shire plc's Specialty Pharmaceuticals business from 2007 until April 2012. Mr. Cola joined Shire in July 2005 as Executive Vice President for Global Therapeutic Business Units and Portfolio Management prior to being named President of the Specialty Pharmaceuticals business. Prior to joining Shire, Mr. Cola spent more than five years at Safeguard Scientifics, where he served as President of the Life Sciences Group. As part of his role with Safeguard Scientifics, Mr. Cola served as Chairman and CEO of Clarient, a cancer diagnostics company, and Chairman of Laureate Pharma, a full service contract manufacturing organization serving research based biologics companies. Prior to joining Safeguard Scientifics, Mr. Cola held progressively senior positions in product development and commercialization at AstraMerck, and later with AstraZeneca. Mr. Cola currently serves on the board of directors of Aevi Genomic Medicine, Inc., Sage Therapeutics, Inc. and Vanda Pharmaceuticals Inc. Mr. Cola received his Bachelor of Arts degree in biology and physics from Ursinus College and his Master of Science degree in biomedical science from Drexel University. Mr. Cola's executive experience in the biopharmaceutical industry, knowledge of our business and service as a director of other biopharmaceutical companies contributed to our board of directors' conclusion that he should serve as a director of our company.

*Terrie Curran* has served as a member of our board of directors since August 2019. As part of a planned transition, Ms. Curran will succeed Mr. Socks as Chief Executive Officer effective upon the closing of the acquisition of her current employer, Celgene Corporation, by Bristol-Myers Squibb Company. Ms. Curran has served as the President, Global Inflammation and Immunology Franchise at Celgene and a member of the Executive Committee since April 2017. Ms. Curran joined Celgene in 2013 as the U.S. Commercial Head of the I&I Franchise and built the capabilities and recruited the teams that executed the successful launch of OTEZLA, before becoming Head of Worldwide Markets. Prior to joining Celgene, she served as Senior Vice President and General Manager - Global Women's Health at Merck & Co. Before joining Merck, Ms. Curran held a number of Country General Manager positions at Schering-Plough and Pharmacia across Europe and Asia Pacific. She currently serves on the board of Myovant Sciences Ltd., a biotechnology company, and previously served on the board of H. Lundbeck A/S, a global pharmaceutical company. Ms. Curran holds a Graduate Diploma of Marketing and a Bachelor of Applied Science (B.A.S.) from the University of Technology, Sydney. Ms. Curran's extensive 22 year biopharmaceutical industry experience contributed to our board of directors' conclusion that she should serve as a director of our company.

*Jon Edwards, Ph.D.* has served as a member of our board of directors since May 2019. Dr. Edwards is a Partner at Medicxi, a life sciences-focused investment firm. Dr. Edwards was part of the Medicxi co-founding team and joined the firm's investment team as an Associate in February 2016. Prior to joining Medicxi, Dr. Edwards was an Associate in the investment team at Index Ventures, a venture capital firm, from September 2014 until February 2016. Dr. Edwards currently serves on the board of a number of private U.S. and European biotechnology and biopharmaceutical companies, including Palladio Biosciences Inc., Xenikos B.V., UltraHuman Limited, Breakpoint Therapeutics GmbH and Sydnexis Inc. Prior to joining Index Ventures, Dr. Edwards was a life sciences strategy consultant at ClearView Healthcare Partners from January 2013 until September 2014. Dr. Edwards received a Ph.D. in Biochemistry and Biophysics from the University of North Carolina at Chapel Hill and conducted postdoctoral research at the Massachusetts Institute of Technology. Dr. Edwards' knowledge of our business and prior service as a director of multiple biopharmaceutical and biotechnology companies contributed to our board of directors' conclusion that he should serve as a director of our company.

*Heidi Kunz* has served as a member of our board of directors since September 2019. Ms. Kunz served as Executive Vice President and Chief Financial Officer of Blue Shield of California from

September 2003 until her retirement in December 2012. Prior to joining Blue Shield of California, she served as Executive Vice President and Chief Financial Officer of Gap, Inc. from 1999 to January 2003. From 1995 to 1999, Ms. Kunz served as the Chief Financial Officer of ITT Industries, Inc. She has also held senior financial management positions at General Motors Corporation, including Vice President and Treasurer during her 16-year tenure from 1979 to 1995. Ms. Kunz currently serves as a director of Agilent Technologies Inc., a global scientific instrument manufacturing and clinical diagnostics company and Avanos Medical, Inc., a public medical device company, and previously served as a director of Financial Engines, Inc., an investment advisement company. Ms. Kunz received an MBA in Finance and Accounting from Columbia Business School and a bachelor's degree in Russian Language from Georgetown University. Ms. Kunz's extensive experience as a chief financial officer and service as a director of other public companies contributed to our board of directors' conclusion that she should serve as a director of our company.

*Chris Slavinsky* has served as a member of our board of directors since August 2019. Since December 2018, Mr. Slavinsky has served as Vice President, Takeda Center for External Innovation as well as Head, Gastroenterology Business Development, Externalization and Special Projects at Takeda. From June 2003 to December 2018, Chris served in a number of capacities at Pfizer, Inc., including as Chief Counsel of several Pfizer business units starting in 2011. Mr. Slavinsky received a J.D. from the Washington University in St. Louis School of Law, an M.S. in biochemistry and molecular biology from Thomas Jefferson University (Philadelphia), and a B.S. in biochemistry from the State University of New York at Stony Brook. Mr. Slavinsky's knowledge of our business and experience in the biopharmaceutical industry has contributed to our board of directors' conclusion that he should serve as director of our company.

*James Topper, M.D., Ph.D.* has served as a member of our board of directors since January 2018. Since 2005, Dr. Topper has also served as the Managing General Partner at Frazier with whom he served as a Partner from 2003 to 2005. Prior to that, from 2002 to 2003, Dr. Topper served as head of the Cardiovascular Research and Development Division at Millennium Pharmaceuticals, Inc., a biopharmaceutical company. Dr. Topper has served as a member of the board of directors of Allena Pharmaceuticals, Inc., a biopharmaceutical company, since September 2011, Alpine Immunosciences Inc., a biotechnology company, since June 2016, Aptinyx Inc., a biopharmaceutical company, since May 2016, and Amunix Pharmaceuticals, Inc., a pharmaceutical company, since October 2018. In addition, from April 2014 to March 2017, Dr. Topper served as a member of the board of directors of Sierra Oncology, Inc. (formerly ProNai Therapeutics, Inc.), an oncology company, and since 2007, Dr. Topper has served as a member of the board of directors of AnaptysBio, Inc., a biotechnology company. From March 2011 to December 2013, Dr. Topper served as a member of the board of directors of Portola Pharmaceuticals, Inc., a biopharmaceutical company, and from 2004 to April 2015 as a member of the board of directors of Amicus Therapeutics, Inc., a biopharmaceutical company. Dr. Topper received a B.S. in Biology from the University of Michigan and an M.D. and a Ph.D. in Biophysics from the Stanford University School of Medicine. He did his postgraduate training in internal medicine and cardiovascular disease at the Brigham and Women's Hospital in Boston and was board certified in both disciplines. Dr. Topper's extensive service as a director of other biopharmaceutical companies contributed to our board of directors' conclusion that he should serve as a director of our company.

## Board Composition and Election of Directors

### *Director Independence*

Our board of directors currently consists of eight members. Our board of directors has determined that Dr. Yamada, Mr. Cola, Dr. Edwards, Ms. Kunz and Dr. Topper are independent directors in accordance with the listing requirements of the Nasdaq Global Market, or Nasdaq. The

Nasdaq independence definition includes a series of objective tests, including that the director is not, and has not been for at least three years, one of our employees and that neither the director nor any of his or her family members has engaged in various types of business dealings with us. In addition, as required by Nasdaq rules, our board of directors has made a subjective determination as to each independent director that no relationships exist, which, in the opinion of our board of directors, would interfere with the exercise of independent judgment in carrying out the responsibilities of the director. In making these determinations, our board of directors reviewed and discussed information provided by the directors and us with regard to each director's business and personal activities and relationships as they may relate to us and our management. There are no family relationships among any of our directors or executive officers.

***Classified Board of Directors***

In accordance with the terms of our amended and restated certificate of incorporation that will go into effect immediately prior to the closing of this offering, our board of directors will be divided into three classes with staggered, three-year terms. At each annual meeting of stockholders, the directors whose terms then expire will be eligible for reelection until the third annual meeting following reelection. Effective upon the closing of this offering, our directors will be divided among the three classes as follows:

- the Class I directors will be Terrie Curran and Jonathan Edwards, Ph.D., and their terms will expire at our first annual meeting of stockholders following this offering;
- the Class II directors will be Michael F. Cola, Chris Slavinsky and James Topper, M.D., Ph.D., and their terms will expire at our second annual meeting of stockholders following this offering; and
- the Class III directors will be Heidi Kunz, David Socks and Tadataka Yamada, M.D., and their terms will expire at our third annual meeting of stockholders following this offering.

Our amended and restated certificate of incorporation that will go into effect immediately prior to the closing of this offering will provide that the authorized number of directors may be changed only by resolution of the board of directors. Any additional directorships resulting from an increase in the number of directors will be distributed among the three classes so that, as nearly as possible, each class will consist of one-third of the directors. The division of our board of directors into three classes with staggered three-year terms may delay or prevent a change of our board of directors or a change in control of our company. Our directors may be removed only for cause by the affirmative vote of the holders of at least two-thirds of our outstanding voting stock then entitled to vote in an election of directors.

**Board Leadership Structure**

Our board of directors is currently led by its chairman, Dr. Yamada. Our board of directors recognizes that it is important to determine an optimal board leadership structure to ensure the independent oversight of management as the company continues to grow. We separate the roles of chief executive officer and chairman of the board of directors in recognition of the differences between the two roles. The chief executive officer is responsible for setting the strategic direction for our company and the day-to-day leadership and performance of our company, while the chairman of the board of directors provides guidance to the chief executive officer and presides over meetings of the full board of directors. We believe that this separation of responsibilities provides a balanced approach to managing the board of directors and overseeing our company.

Our board of directors has concluded that our current leadership structure is appropriate at this time. However, our board of directors will continue to periodically review our leadership structure and may make such changes in the future as it deems appropriate.

### Role of Board in Risk Oversight Process

Our board of directors has responsibility for the oversight of our risk management processes and, either as a whole or through its committees, regularly discusses with management our major risk exposures, their potential impact on our business and the steps we take to manage them. The risk oversight process includes receiving regular reports from board committees and members of senior management to enable our board of directors to understand our risk identification, risk management and risk mitigation strategies with respect to areas of potential material risk, including operations, finance, legal, regulatory, strategic and reputational risk.

The audit committee reviews information regarding liquidity and operations, and oversees our management of financial risks. Periodically, the audit committee reviews our policies with respect to risk assessment, risk management, loss prevention and regulatory compliance. Oversight by the audit committee includes direct communication with our external auditors, and discussions with management regarding significant risk exposures and the actions management has taken to limit, monitor or control such exposures. The compensation committee is responsible for assessing whether any of our compensation policies or programs has the potential to encourage excessive risk-taking. The nominating and corporate governance committee manages risks associated with the independence of the board of directors, corporate disclosure practices and potential conflicts of interest. While each committee is responsible for evaluating certain risks and overseeing the management of such risks, the entire board of directors is regularly informed through committee reports about such risks. Matters of significant strategic risk are considered by our board of directors as a whole.

### Board Committees and Independence

Our board of directors has established three standing committees—audit, compensation and nominating and corporate governance—each of which operates under a charter that has been approved by our board of directors.

#### *Audit Committee*

The audit committee's main function is to oversee our accounting and financial reporting processes and the audits of our financial statements. This committee's responsibilities include, among other things:

- appointing our independent registered public accounting firm;
- evaluating the qualifications, independence and performance of our independent registered public accounting firm;
- approving the audit and non-audit services to be performed by our independent registered public accounting firm;
- reviewing the design, implementation, adequacy and effectiveness of our internal accounting controls and our critical accounting policies;
- discussing with management and the independent registered public accounting firm the results of our annual audit and the review of our quarterly unaudited combined financial statements;
- reviewing, overseeing and monitoring the integrity of our financial statements and our compliance with legal and regulatory requirements as they relate to financial statements or accounting matters;
- reviewing on a periodic basis, or as appropriate, any investment policy and recommending to our board of directors any changes to such investment policy;

- reviewing with management and our auditors any earnings announcements and other public announcements regarding our results of operations;
- preparing the report that the SEC requires in our annual proxy statement;
- reviewing and approving any related party transactions and reviewing and monitoring compliance with our code of conduct and ethics; and
- reviewing and evaluating, at least annually, the performance of the audit committee and its members including compliance of the audit committee with its charter.

The members of our audit committee are Ms. Kunz, Mr. Cola and Mr. Slavinsky. Ms. Kunz serves as the chairperson of the committee. All members of our audit committee meet the requirements for financial literacy under the applicable rules and regulations of the SEC and Nasdaq. Our board of directors has determined that Ms. Kunz is an "audit committee financial expert" as defined by applicable SEC rules and has the requisite financial sophistication as defined under the applicable Nasdaq listing standards. Our board of directors has determined each of Ms. Kunz and Mr. Cola is independent under the applicable rules of the SEC and Nasdaq. Under the applicable Nasdaq rules, we are permitted to phase in our compliance with the independent audit committee requirements of Nasdaq on the same schedule as we are permitted to phase in our compliance with the independent audit committee requirements pursuant to Rule 10A-3 under the Exchange Act, which requires all members to be independent within one year of listing. We will comply with the phase-in requirements of the Nasdaq rules and within one year of our listing on Nasdaq, all members of our audit committee will be independent under Nasdaq rules and Rule 10A-3. Upon the listing of our common stock on Nasdaq, the audit committee will operate under a written charter that satisfies the applicable standards of the SEC and Nasdaq.

***Compensation Committee***

Our compensation committee approves policies relating to compensation and benefits of our officers and employees. The compensation committee approves corporate goals and objectives relevant to the compensation of our Chief Executive Officer and other executive officers, evaluates the performance of these officers in light of those goals and objectives and approves the compensation of these officers based on such evaluations. The compensation committee also approves the issuance of stock options and other awards under our equity plans. The compensation committee will review and evaluate, at least annually, the performance of the compensation committee and its members, including compliance by the compensation committee with its charter.

The members of our compensation committee are Mr. Cola, Dr. Edwards, Dr. Topper and Dr. Yamada. Mr. Cola serves as the chairperson of the committee. Our board of directors has determined that each member of this committee is independent under the applicable Nasdaq listing standards, is a "non-employee director" as defined in Rule 16b-3 promulgated under the Exchange Act. Upon the listing of our common stock on Nasdaq, the compensation committee will operate under a written charter, which the compensation committee will review and evaluate at least annually.

***Nominating and Corporate Governance Committee***

The nominating and corporate governance committee is responsible for assisting our board of directors in discharging the board of directors' responsibilities regarding the identification of qualified candidates to become board members, the selection of nominees for election as directors at our annual meetings of stockholders (or special meetings of stockholders at which directors are to be elected), and the selection of candidates to fill any vacancies on our board of directors and any committees thereof. In addition, the nominating and corporate governance committee is responsible for

overseeing our corporate governance policies, reporting and making recommendations to our board of directors concerning governance matters and oversight of the evaluation of our board of directors. The members of our nominating and corporate governance committee are Dr. Edwards, Dr. Topper and Dr. Yamada. Dr. Edwards serves as the chairperson of the committee. Our board of directors has determined that each member of this committee is independent under the applicable Nasdaq listing standards. Upon the listing of our common stock on Nasdaq, the nominating and corporate governance committee will operate under a written charter, which the nominating and corporate governance committee will review and evaluate at least annually.

**Compensation Committee Interlocks and Insider Participation**

None of the members of our compensation committee has ever been one of our officers or employees. None of our executive officers currently serves, or has served, as a member of the board of directors or compensation committee of any entity that has one or more executive officers serving as a member of our board of directors or compensation committee.

**Board Diversity**

Upon the closing of this offering, our nominating and corporate governance committee will be responsible for reviewing with the board of directors, on an annual basis, the appropriate characteristics, skills and experience required for the board of directors as a whole and its individual members. In evaluating the suitability of individual candidates (both new candidates and current members) for election or appointment, the nominating and corporate governance committee and the board of directors will take into account many factors, including the following:

- personal and professional integrity, ethics and values;
- experience in corporate management, such as serving as an officer or former officer of a publicly-held company;
- experience as a board member or executive officer of another publicly-held company;
- strong finance experience;
- diversity of expertise and experience in substantive matters pertaining to our business relative to other board members;
- diversity of background and perspective, including, but not limited to, with respect to age, gender, race, place of residence and specialized experience;
- experience relevant to our business industry and with relevant social policy concerns; and
- relevant academic expertise or other proficiency in an area of our business operations.

Currently, our board of directors evaluates, and following the closing of this offering will evaluate, each individual in the context of the board of directors as a whole, with the objective of assembling a group that can best maximize the success of the business and represent stockholder interests through the exercise of sound judgment using its diversity of experience in these various areas.

### Code of Conduct and Ethics

We have adopted a written code of conduct and ethics that applies to our directors, officers and employees, including our principal executive officer, principal financial officer, principal accounting officer or controller, or persons performing similar functions, which will be effective upon the closing of this offering. Upon the closing of this offering, our code of conduct and ethics will be available under the Corporate Governance section of our website at www.phathompharma.com. In addition, we intend to post on our website all disclosures that are required by law or the listing standards of Nasdaq concerning any amendments to, or waivers from, any provision of the code. The reference to our website address does not constitute incorporation by reference of the information contained at or available through our website, and you should not consider it to be a part of this prospectus.

## EXECUTIVE AND DIRECTOR COMPENSATION

This section discusses the material components of the executive compensation program for our named executive officer who is named in the “Summary Compensation Table” below.

For 2018, our only “named executive officer” was David Socks, our President, Chief Executive Officer, Treasurer and Secretary, and member of our board of directors.

This discussion may contain forward-looking statements that are based on our current plans, considerations, expectations and determinations regarding future compensation programs. Actual compensation programs that we adopt following the closing of this offering may differ materially from the currently planned programs summarized in this discussion.

We are an “emerging growth company,” as that term is used in the JOBS Act, and have elected to comply with the reduced compensation disclosure requirements available to emerging growth companies under the JOBS Act.

### Summary Compensation Table

The following table presents summary information regarding the total compensation that was awarded to, earned by or paid to our named executive officer for services rendered during the year ended December 31, 2018.

| Name and Principal Position | Year | Salary ($) | Bonus ($) | Stock Awards ($) | All Other Compensation ($)[1] | Total ($) |
|---|---|---|---|---|---|---|
| *David Socks*<br>*President, Chief Executive Officer, Treasurer, Secretary and Director* | 2018 | 153,333 | – | – | 16,812 | 170,145 |

(1) Represents benefit costs paid on behalf of Mr. Socks by our company.

### Narrative Disclosure to Summary Compensation Table

#### *Annual Base Salary*

The compensation of our executive officers is generally determined and approved at the time of their commencement of employment by our board of directors or the compensation committee.

The annual base salary for Mr. Socks for his service as our Chief Executive Officer was $160,000 for 2018.

In connection with the Takeda License and Mr. Socks’ increased responsibilities as our President and Chief Executive Officer, our board of directors increased his base salary to $340,000, effective May 1, 2019.

#### *Bonus Compensation*

From time to time our board of directors or compensation committee may approve bonuses for our executive officers based on individual performance, company performance or as otherwise determined appropriate. No formal bonus plan was in effect during 2018.

***Equity-Based Incentive Awards***

Our equity-based incentive awards are designed to align our interests and the interests of our stockholders with those of our employees and consultants, including our named executive officer. Our board of directors or the compensation committee approves equity grants.

On February 13, 2018, we issued and sold to Mr. Socks, 1,686,704 shares of our common stock for a per share purchase price of $0.0002958.

On March 13, 2019, we entered into a stock restriction agreement with Mr. Socks whereby Mr. Socks' previously-acquired 1,686,704 shares of our common stock were subjected to new vesting conditions, such that 421,676 shares were deemed vested as of March 13, 2019 and the remaining 1,265,028 shares were converted into unvested shares of restricted stock that vest in equal monthly installments over the 48 months thereafter ending on March 13, 2023, subject, in each case, to continued employment or status as a service provider. Any unvested shares held by Mr. Socks upon a termination of employment or service (after giving effect to any accelerated vesting provisions described further below), will be subject to repurchase by us at the original purchase price.

Under Mr. Socks' stock restriction agreement, 100% of any unvested shares will automatically accelerate and vest upon (i) a termination of service by us without cause or by him for good reason following a change in control, or (ii) the refusal by us to enter into a consulting agreement with him in connection with his resignation, subject to his continued employment or service through the date of such event.

***Defined Terms Applicable to Stock Restriction Agreement***

For purposes of the stock restriction agreement with Mr. Socks, "change in control" generally has the same meaning given to such term in our Existing Incentive Plan, as described below.

For purposes of the stock restriction agreement with Mr. Socks, "good reason" means the occurrence of any of the following events or conditions without his consent: (i) a material diminution in authority, duties or responsibilities; (ii) a material diminution in base compensation, unless such reduction is imposed across-the-board to senior management of the Company; (iii) a material change in the geographic location at which he must perform his duties (and the parties acknowledge that a relocation of our principal executive offices to a location more than fifty (50) miles from our then-current offices at which the individual is providing services (excepting reasonable travel on business) shall constitute a material change for purposes of this clause (iii)); or (iv) any other action or inaction that constitutes a material breach by us or any successor or affiliate of our obligations to him under the stock restriction agreement.

For purposes of the stock restriction agreement with Mr. Socks, "cause" means one or more of the following has occurred, as determined in good faith by us in our reasonable discretion: (i) conviction of, or plea of nolo contendere to, any felony or of any crime involving either moral turpitude or dishonesty; (ii) intentional participation in a fraud or intentional act of dishonesty against our company or any of our customers or business partners; (iii) material breach of duties; (iv) material breach of any written agreement with us if such breach has not been cured, or services ceased, within thirty (30) days of receiving written notice thereof; and (v) failure to comply with the reasonable and lawful directives of management.

**Employment Letters with our Executive Officers**

In 2018, none of our executive officers were parties to employment agreements or other similar arrangements with us. Each of our executive officers' employment is "at will" and may be terminated at any time, subject to our contractual obligations to them as described below.

***Employment Letter with David Socks***

We entered into an employment letter with Mr. Socks setting forth the terms of his employment, effective May 7, 2019 in connection with entering into the Takeda License.

The employment letter for Mr. Socks provides for an annual base salary of $340,000, and an annual bonus with a target amount equal to 50% of Mr. Socks' annual base salary. Under the employment letter for Mr. Socks, he will devote at least 80% of his time to our company. Additionally, under the employment letter, Mr. Socks is eligible to participate in all employee benefit plans and programs generally available to similarly situated employees of our company and is entitled to vacation benefits in accordance with our policies.

***Employment Letter with Terrie Curran***

We have entered into an employment letter with Ms. Curran, pursuant to which we have appointed her as a member of our board of directors and offered her employment as our Chief Executive Officer. Under the terms of the employment letter, Ms. Curran must commence full-time employment with us as our Chief Executive Officer within two weeks after the completion of the planned acquisition of her current employer but in no event later than December 31, 2019, or the Start Date Deadline. In the event Ms. Curran has not commenced full-time employment with us as our Chief Executive Officer prior to such deadline, the employment offer will cease to be outstanding.

The employment letter for Ms. Curran provides for an initial annual base salary of $500,000, and an annual bonus with a target amount equal to 50% of her annual base salary. Her annual bonus for 2019 will be pro-rated based on the portion of the year she is employed by us. Additionally, under the employment letter, Ms. Curran will be eligible to participate in all employee benefit plans and programs generally available to similarly situated employees of our company and is entitled to vacation benefits in accordance with our policies.

Effective August 29, 2019, we appointed Ms. Curran to our board of directors. In connection with her appointment to the board, we granted her stock options to purchase 867,200 shares of our common stock under the Existing Incentive Plan. The stock options have a ten-year term and an exercise price of $6.95 per share, which our board of directors determined was equal to the fair market value per share of our common stock on the date of grant. Ms. Curran's options will vest over a four-year period, with 25% of the stock options vesting on the first anniversary of her commencement of employment with us and the remaining stock options vesting in 36 equal monthly installments thereafter, subject to her continued employment or service on each vesting date. In the event Ms. Curran does not commence employment with us as our Chief Executive Officer prior to the Start Date Deadline, all of the stock options granted to her in connection with her appointment to the board will terminate immediately, regardless of her continued service on the board of directors.

Regardless of the manner in which Ms. Curran's employment terminates, she will be entitled to receive amounts previously earned during her term of employment, including unpaid salary and accrued but unused vacation. In addition, Ms. Curran will be entitled to certain severance benefits under her employment letter, subject to her execution of a release of claims, returning of all company property, compliance with post-termination obligations and resignation from positions with us.

Ms. Curran's employment letter provides for severance benefits for certain terminations that arise during and outside a change in control period (as defined below). Upon a termination without cause or resignation for good reason outside of a change in control period, Ms. Curran will be entitled to: (1) continuation of her base salary for 12 months (such applicable period, the "severance period"), (2) a lump sum equal to her target bonus for the year during which such termination occurs, plus any unpaid annual bonus for the calendar year prior to the year in which her termination occurs, to the extent she is entitled to such bonus and if such bonus has not already been paid, (3) payment of the COBRA premiums for her and her eligible dependents until the earliest of (a) the end the severance period, (b) expiration of her eligibility under for continuation coverage under COBRA, or (c) the date she becomes eligible for health insurance coverage in connection with her new employment, and (4) acceleration of the vesting of all outstanding equity awards that would have vested during the severance period.

Upon a termination without cause or resignation for good reason that occurs during the period that is three months prior to or any time on or after a change in control (such period, the "change in control period"), Ms. Curran will be entitled to all of the same severance benefits described above, except (1) the severance period is increased from 12 months to 18 months, (2) Ms. Curran will be entitled to a lump sum payment equal to 1.5 times her target bonus for the year during which such termination occurs, plus any unpaid annual bonus for the calendar year prior to the year in which her termination occurs, to the extent she is entitled to such bonus and if such bonus has not already been paid, and (3) all unvested and outstanding equity awards will become fully vested on the later of the date her release of claims becomes effective or the date of the change in control.

For purposes of Ms. Curran's employment letter:

- "cause" means (1) her commission of an act of fraud, embezzlement or dishonesty, or the commission of some other illegal act, that has a demonstrable adverse impact on us or any successor or affiliate thereof; (2) her conviction of, or plea of "guilty" or "no contest" to, a felony or any crime involving fraud, dishonesty or moral turpitude under the laws of the United States or any state thereof; (3) any intentional, unauthorized use or disclosure by her of the confidential information or trade secrets of the company or any successor or affiliate thereof; (4) her gross negligence, insubordination or material violation of any duty of loyalty to us or any successor or affiliate thereof, or any other demonstrable material misconduct on her part; (5) her ongoing and repeated failure or refusal to perform or neglect of her duties as required by the employment letter or her ongoing and repeated failure or refusal to comply with the instructions given to her by the board of directors, which failure, refusal or neglect continues for 15 days following her receipt of written notice from the board of directors stating with specificity the nature of such failure, refusal or neglect; or (6) her willful, material breach of any material company policy or any material provision of the employment letter or her proprietary information and inventions assignment agreement.
- "change in control" has the same meaning given to such term in our Existing Incentive Plan; and
- "good reason" means any of the following without her written consent: (1) a material diminution in her authority, duties or responsibilities; (2) a material diminution in her base compensation (and any diminution of 10% or more shall be considered material for this purpose, regardless of whether such diminution occurs due to a single reduction or a series of reductions in her base compensation), unless such a reduction is imposed across-the-board to senior management; (3) a material change in the geographic location at which she must perform her duties; or (4) any other action or inaction that constitutes a material breach by us or any successor or affiliate of its obligations to her under the employment letter.

***Employment Letters with Other Executives***

We have also entered into employment letters with each of our other executive officers, Aditya Kohli, Ph.D., our Chief Business Officer, and Azmi Nabulsi, M.D., M.P.H., our Chief Operating Officer. Each employment letter sets forth the terms of their employment, each effective on May 7, 2019 in connection with entering into the Takeda License.

The employment letters for Drs. Kohli and Nabulsi each provide for an annual base salary of $180,000 and $470,000, respectively, and an annual bonus with a target amount equal to 35% and 40% of the executive's annual base salary, respectively. Pursuant to his employment letter, Dr. Kohli's base salary will increase to $220,000, effective August 1, 2019. Under his employment letter, Dr. Nabulsi will work for our company on a full-time basis. Under his employment letter, Dr. Kohli will devote at least 80% of his time to our company. Additionally, under the employment letters, each executive is eligible to participate in all employee benefit plans and programs generally available to similarly situated employees of our company and is entitled to vacation benefits in accordance with our policies.

In September 2019, we amended and restated the employment letter for Dr. Nabulsi to provide certain severance benefits under his employment letter, subject to his execution of a release of claims, returning of all company property, compliance with post-termination obligations and resignation from positions with us.

Dr. Nabulsi's amended and restated employment letter provides for severance benefits for certain terminations that arise during and outside a change in control period (as defined below). Upon a termination without cause or resignation for good reason outside of a change in control period, Dr. Nabulsi will be entitled to: (1) continuation of his base salary for 9 months (such applicable period, the "severance period"), (2) a lump sum equal to his prorated target bonus for the year during which such termination occurs, plus any unpaid annual bonus for the calendar year prior to the year in which his termination occurs, to the extent he is entitled to such bonus and if such bonus has not already been paid, (3) payment of the COBRA premiums for him and his eligible dependents until the earliest of (a) the end the severance period, (b) expiration of his eligibility under for continuation coverage under COBRA, or (c) the date he becomes eligible for health insurance coverage in connection with his new employment, and (4) acceleration of the vesting of all outstanding equity awards that would have vested during the severance period.

Upon a termination without cause or resignation for good reason that occurs during the period that is three months prior to or the 24 months following a change in control (such period, the "change in control period"), Dr. Nabulsi will be entitled to all of the same severance benefits described above, except (1) the severance period is increased from 9 months to 12 months, (2) Dr. Nabulsi will be entitled to a lump sum payment equal to his target bonus for the year during which such termination occurs, plus any unpaid annual bonus for the calendar year prior to the year in which his termination occurs, to the extent he is entitled to such bonus and if such bonus has not already been paid, and (3) all unvested and outstanding equity awards will become fully vested on the later of the date his release of claims becomes effective or the date of the change in control.

For purposes of Dr. Nabulsi's amended and restated offer letter, "cause", "change in control" and "good reason" have the same definitions as set forth in Ms. Curran's employment letter described above.

**Outstanding Equity Awards at Fiscal Year-End**

Our named executive officer did not hold any unvested equity awards granted as of December 31, 2018.

### Other Elements of Compensation

#### *Perquisites, Health, Welfare and Retirement Benefits*

We generally do not maintain employee benefit plans or provide perquisites or personal benefits to our executive officers. We do, however, reimburse certain of our executive officers for costs related to health and welfare benefits they receive pursuant to other sources. Our board of directors may elect to adopt qualified or non-qualified benefit plans in the future if it determines that doing so is in our best interests.

#### *Nonqualified Deferred Compensation*

We do not maintain nonqualified defined contribution plans or other nonqualified deferred compensation plans. Our board of directors may elect to provide our officers and other employees with non-qualified defined contribution or other nonqualified deferred compensation benefits in the future if it determines that doing so is in our best interests.

#### *Change in Control Benefits*

Our named executive officer may become entitled to certain benefits or enhanced benefits in connection with a change in control of our company. The stock restriction agreement with our named executive officer provides for accelerated vesting of all outstanding equity awards upon a qualifying termination in connection with a change in control of our company.

### Incentive Award Plans

#### *2019 Incentive Award Plan*

Our board of directors and stockholders have adopted the 2019 Plan, which will become effective in connection with this offering. Under the 2019 Plan, we may grant cash and equity incentive awards to eligible employees, directors and consultants in order to attract, motivate and retain the talent for which we compete. The material terms of the 2019 Plan are summarized below.

*Eligibility and Administration*

Our employees, consultants and directors, and employees and consultants of our subsidiaries, will be eligible to receive awards under the 2019 Plan. Following our initial public offering, the 2019 Plan will generally be administered by our board of directors with respect to awards to non-employee directors and by our compensation committee with respect to other participants, each of which may delegate its duties and responsibilities to committees of our directors and/or officers (referred to collectively as the plan administrator below), subject to certain limitations that may be imposed under the 2019 Plan, Section 16 of the Exchange Act and/or stock exchange rules, as applicable. The plan administrator will have the authority to make all determinations and interpretations under, prescribe all forms for use with, and adopt rules for the administration of, the 2019 Plan, subject to its express terms and conditions. The plan administrator will also set the terms and conditions of all awards under the 2019 Plan, including any vesting and vesting acceleration conditions.

*Limitation on Awards and Shares Available*

An aggregate of 2,700,000 shares of our common stock will initially be available for issuance under awards granted pursuant to the 2019 Plan. The number of shares initially available for issuance will be increased by (i) the number of shares subject to stock options or similar awards granted under our existing 2019 Equity Incentive Plan, or the Existing Incentive Plan, that expire or otherwise

terminate without having been exercised in full after the effective date of the 2019 Plan and unvested shares issued pursuant to awards granted under our Existing Incentive Plan, that are forfeited to or repurchased by us after the effective date of the 2019 Plan, with the maximum number of shares to be added to the 2019 Plan pursuant to clause (i) above equal to 1,416,788 shares, and (ii) an annual increase on January 1 of each calendar year beginning in 2020 and ending in 2029, equal to the lesser of (a) 5% of the shares of common stock outstanding on the final day of the immediately preceding calendar year and (b) such smaller number of shares as determined by our board of directors. No more than 40,000,000 shares of common stock may be issued upon the exercise of incentive stock options under the 2019 Plan. Shares issued under the 2019 Plan may be authorized but unissued shares, shares purchased in the open market or treasury shares.

If an award under the 2019 Plan or the Existing Incentive Plan expires, lapses or is terminated, exchanged for cash, surrendered, repurchased, canceled without having been fully exercised or forfeited, any shares subject to such award will, as applicable, become or again be available for new grants under the 2019 Plan. Further, shares delivered to us to satisfy the applicable exercise or purchase price of an award under the 2019 Plan or the Existing Incentive Plan and/or to satisfy any applicable tax withholding obligations (including shares retained by us from the award under the 2019 Plan or the Existing Incentive Plan being exercised or purchased and/or creating the tax obligation) will become or again be available for award grants under the 2019 Plan. Awards granted under the 2019 Plan upon the assumption of, or in substitution for, awards authorized or outstanding under a qualifying equity plan maintained by an entity with which we enter into a merger or similar corporate transaction will not reduce the shares available for grant under the 2019 Plan.

*Awards*

The 2019 Plan provides for the grant of stock options, including incentive stock options, or ISOs, and nonqualified stock options, or NSOs, restricted stock, dividend equivalents, restricted stock units, or RSUs, stock appreciation rights, or SARs, and other stock or cash-based awards. Certain awards under the 2019 Plan may constitute or provide for a deferral of compensation, subject to Section 409A of the Code, which may impose additional requirements on the terms and conditions of such awards. All awards under the 2019 Plan will be set forth in award agreements, which will detail the terms and conditions of the awards, including any applicable vesting and payment terms and post-termination exercise limitations. A brief description of each award type follows.

*Stock Options*. Stock options provide for the purchase of shares of our common stock in the future at an exercise price set on the grant date. ISOs, by contrast to NSOs, may provide tax deferral beyond exercise and favorable capital gains tax treatment to their holders if certain holding period and other requirements of the Code are satisfied. The exercise price of a stock option will not be less than 100% of the fair market value of the underlying share on the date of grant (or 110% in the case of ISOs granted to certain significant stockholders), except with respect to certain substitute options granted in connection with a corporate transaction. The term of a stock option may not be longer than ten years (or five years in the case of ISOs granted to certain significant stockholders). Vesting conditions determined by the plan administrator may apply to stock options and may include continued service, performance and/or other conditions. ISOs generally may be granted only to our employees and employees of our parent or subsidiary corporations, if any.

*SARs*. SARs entitle their holder, upon exercise, to receive from us an amount equal to the appreciation of the shares subject to the award between the grant date and the exercise date. The exercise price of a SAR will not be less than 100% of the fair market value of the underlying share on the date of grant (except with respect to certain substitute SARs granted in connection with a corporate transaction), and the term of a SAR may not be longer than ten years. Vesting conditions determined by the plan administrator may apply to SARs and may include continued service, performance and/or other conditions.

*Restricted Stock and RSUs*. Restricted stock is an award of nontransferable shares of our common stock that remain forfeitable unless and until specified conditions are met, and which may be subject to a purchase price. RSUs are contractual promises to deliver shares of our common stock in the future, which may also remain forfeitable unless and until specified conditions are met and may be accompanied by the right to receive the equivalent value of dividends paid on shares of our common stock prior to the delivery of the underlying shares. Delivery of the shares underlying RSUs may be deferred under the terms of the award or at the election of the participant, if the plan administrator permits such a deferral. Conditions applicable to restricted stock and RSUs may be based on continuing service, the attainment of performance goals and/or such other conditions as the plan administrator may determine.

*Other Stock or Cash-Based Awards.* Other stock or cash-based awards are awards of cash, fully vested shares of our common stock and other awards valued wholly or partially by referring to, or otherwise based on, shares of our common stock. Other stock or cash-based awards may be granted to participants and may also be available as a payment form in the settlement of other awards, as standalone payments and as payment in lieu of base salary, bonus, fees or other cash compensation otherwise payable to any individual who is eligible to receive awards. The plan administrator will determine the terms and conditions of other stock or cash-based awards, which may include vesting conditions based on continued service, performance and/or other conditions.

*Performance Awards*

Performance awards include any of the foregoing awards that are granted subject to vesting and/or payment based on the attainment of specified performance goals or other criteria the plan administrator may determine, which may or may not be objectively determinable. Performance criteria upon which performance goals are established by the plan administrator may include: net earnings or losses (either before or after one or more of interest, taxes, depreciation, amortization and non-cash equity-based compensation expense); gross or net sales or revenue or sales or revenue growth; net income (either before or after taxes) or adjusted net income; profits (including, but not limited to, gross profits, net profits, profit growth, net operation profit or economic profit), profit return ratios or operating margin; budget or operating earnings (either before or after taxes or before or after allocation of corporate overhead and bonus); cash flow (including operating cash flow and free cash flow or cash flow return on capital); return on assets; return on capital or invested capital; cost of capital; return on stockholders' equity; total stockholder return; return on sales; costs, reductions in costs and cost control measures; expenses; working capital; earnings or loss per share; adjusted earnings or loss per share; price per share or dividends per share (or appreciation in or maintenance of such price or dividends); regulatory achievements or compliance; implementation, completion or attainment of objectives relating to research, development, regulatory, commercial or strategic milestones or developments; market share; economic value or economic value added models; division, group or corporate financial goals; customer satisfaction/growth; customer service; employee satisfaction; recruitment and maintenance of personnel; human resources management; supervision of litigation and other legal matters; strategic partnerships and transactions; financial ratios (including those measuring liquidity, activity, profitability or leverage); debt levels or reductions; sales-related goals; financing and other capital raising transactions; cash on hand; acquisition activity; investment sourcing activity; and marketing initiatives, any of which may be measured in absolute terms or as compared to any incremental increase or decrease. Such performance goals also may be based solely by reference to our performance or the performance of a subsidiary, division, business segment or business unit, or based upon performance relative to performance of other companies or upon comparisons of any of the indicators of performance relative to performance of other companies.

*Provisions of the 2019 Plan Relating to Director Compensation*

The 2019 Plan provides that the plan administrator may establish compensation for non-employee directors from time to time subject to the 2019 Plan's limitations. Prior to commencing this offering, our stockholders approved the initial terms of our non-employee director compensation program, which is described below under the heading "—Director Compensation." Our board of directors or its authorized committee may modify the non-employee director compensation program from time to time in the exercise of its business judgment, taking into account such factors, circumstances and considerations as it shall deem relevant from time to time, provided that the sum of any cash compensation or other compensation and the grant date fair value (as determined in accordance with ASC 718, or any successor thereto) of any equity awards granted as compensation for services as a non-employee director during any fiscal year may not exceed $750,000, increased to $1,000,000, in the fiscal year of a non-employee director's initial service as a non-employee director. The plan administrator may make exceptions to this limit for individual non-employee directors in extraordinary circumstances, as the plan administrator may determine in its discretion, provided that the non-employee director receiving such additional compensation may not participate in the decision to award such compensation or in other contemporaneous compensation decisions involving non-employee directors.

*Certain Transactions*

In connection with certain transactions and events affecting our common stock, including a change in control, or change in any applicable laws or accounting principles, the plan administrator has broad discretion to take action under the 2019 Plan to prevent the dilution or enlargement of intended benefits, facilitate such transaction or event, or give effect to such change in applicable laws or accounting principles. This includes canceling awards in exchange for either an amount in cash or other property with a value equal to the amount that would have been obtained upon exercise or settlement of the vested portion of such award or realization of the participant's rights under the vested portion of such award, accelerating the vesting of awards, providing for the assumption or substitution of awards by a successor entity, adjusting the number and type of shares available, replacing awards with other rights or property or terminating awards under the 2019 Plan. In the event of a change in control where the acquirer does not assume awards granted under the 2019 Plan, awards issued under the 2019 Plan shall be subject to accelerated vesting such that 100% of the awards will become vested and exercisable or payable, as applicable, and which may be subject to such terms and conditions as apply generally to holders of common stock under the change in control documents. In addition, in the event of certain non-reciprocal transactions with our stockholders, or an "equity restructuring," the plan administrator will make equitable adjustments to the 2019 Plan and outstanding awards as it deems appropriate to reflect the equity restructuring.

For purposes of the 2019 Plan, a "change in control" means and includes each of the following: (i) a transaction or series of transactions (other than an offering of our common stock to the general public through a registration statement filed with the SEC or a transaction or series of transactions that meets the requirements of clauses (x) and (y) of clause (iii) below) whereby any "person" or related "group" of "persons" (as such terms are used in Sections 13(d) and 14(d)(2) of the Exchange Act) (other than us, any of our subsidiaries, an employee benefit plan maintained by us or any of our subsidiaries or a "person" that, prior to such transaction, directly or indirectly controls, is controlled by, or is under common control with, us) directly or indirectly acquires beneficial ownership (within the meaning of Rule 13d-3 under the Exchange Act) of our securities possessing more than 50% of the total combined voting power of our securities outstanding immediately after such acquisition; or (ii) during any period of two consecutive years, individuals who, at the beginning of such period, constitute the board of directors together with any new director(s) (other than a director designated by a person who shall have entered into an agreement with us to effect a transaction described in clauses

(i) or (iii)) whose election by the board of directors or nomination for election by our stockholders was approved by a vote of at least two-thirds of the directors then still in office who either were directors at the beginning of the two-year period or whose election or nomination for election was previously so approved, cease for any reason to constitute a majority thereof; or (iii) the consummation by us (whether directly involving us or indirectly involving us through one or more intermediaries) of (a) a merger, consolidation, reorganization, or business combination or (b) a sale or other disposition of all or substantially all of our assets in any single transaction or series of related transactions or (c) the acquisition of assets or stock of another entity, in each case other than a transaction: (x) which results in our voting securities outstanding immediately before the transaction continuing to represent (either by remaining outstanding or by being converted into our voting securities or the voting securities of a successor entity, directly or indirectly, at least a majority of the combined voting power of our outstanding voting securities or the successor entity's outstanding voting securities immediately after the transaction, and (y) after which no person or group beneficially owns voting securities representing 50% or more of the combined voting power of us or the successor entity (provided that no person will be treated as beneficially owning 50% or more of the combined voting power of us or the successor entity for purposes of this clause (y) solely as a result of the voting power held in us prior to the consummation of the transaction).

*Foreign Participants, Claw-Back Provisions, Transferability and Participant Payments*

With respect to foreign participants, the plan administrator may modify award terms, establish subplans and/or adjust other terms and conditions of awards, subject to the share limits described above. All awards will be subject to the provisions of any claw-back policy implemented by our company to the extent set forth in such claw-back policy or in the applicable award agreement. With limited exceptions for estate planning, domestic relations orders, certain beneficiary designations and the laws of descent and distribution, awards under the 2019 Plan are generally non-transferable prior to vesting and are exercisable only by the participant. With regard to tax withholding obligations arising in connection with awards under the 2019 Plan and exercise price obligations arising in connection with the exercise of stock options under the 2019 Plan, the plan administrator may, in its discretion, accept cash, wire transfer, or check, shares of our common stock that meet specified conditions, a "market sell order" or such other consideration as it deems suitable or any combination of the foregoing.

*Plan Amendment and Termination*

Our board of directors may amend or terminate the 2019 Plan at any time; however, except in connection with certain changes in our capital structure, stockholder approval will be required for any amendment that increases the number of shares available under the 2019 Plan. The plan administrator will have the authority, without the approval of our stockholders, to amend any outstanding stock option or SAR to reduce its exercise price per share. No award may be granted pursuant to the 2019 Plan after the tenth anniversary of the date on which our board of directors adopted the 2019 Plan.

*Securities Laws*

The 2019 Plan is intended to conform to all provisions of the Securities Act, and the Exchange Act and any and all regulations and rules promulgated by the SEC thereunder, including, without limitation, Rule 16b-3. The 2019 Plan will be administered, and awards will be granted and may be exercised, only in such a manner as to conform to such laws, rules and regulations.

*Federal Income Tax Consequences*

The material federal income tax consequences of the 2019 Plan under current federal income tax law are summarized in the following discussion, which deals with the general tax principles applicable

to the 2019 Plan. The following discussion is based upon laws, regulations, rulings and decisions now in effect, all of which are subject to change. Foreign, state and local tax laws, and employment, estate and gift tax considerations are not discussed due to the fact that they may vary depending on individual circumstances and by locality.

Stock Options and SARs. A 2019 Plan participant generally will not recognize taxable income and we generally will not be entitled to a tax deduction upon the grant of a stock option or SAR. The tax consequences of exercising a stock option and the subsequent disposition of the shares received upon exercise will depend upon whether the option qualifies as an ISO or an NSO. Upon exercising an NSO when the fair market value of our stock is higher than the exercise price of the option, a 2019 Plan participant generally will recognize taxable income at ordinary income tax rates equal to the excess of the fair market value of the stock on the date of exercise over the purchase price, and we (or our subsidiaries, if any) generally will be entitled to a corresponding tax deduction for compensation expense, in the amount equal to the amount by which the fair market value of the shares purchased exceeds the purchase price for the shares. Upon a subsequent sale or other disposition of the option shares, the participant will recognize a short-term or long-term capital gain or loss in the amount of the difference between the sales price of the shares and the participant's tax basis in the shares.

Upon exercising an ISO, a 2019 Plan participant generally will not recognize taxable income, and we will not be entitled to a tax deduction for compensation expense. However, upon exercise, the amount by which the fair market value of the shares purchased exceeds the purchase price will be an item of adjustment for alternative minimum tax purposes. The participant will recognize taxable income upon a sale or other taxable disposition of the option shares. For federal income tax purposes, dispositions are divided into two categories: qualifying and disqualifying. A qualifying disposition generally occurs if the sale or other disposition is made more than two years after the date the option was granted and more than one year after the date the shares are transferred upon exercise. If the sale or disposition occurs before these two periods are satisfied, then a disqualifying disposition generally will result.

Upon a qualifying disposition of ISO shares, the participant will recognize long-term capital gain in an amount equal to the excess of the amount realized upon the sale or other disposition of the shares over their purchase price. If there is a disqualifying disposition of the shares, then the excess of the fair market value of the shares on the exercise date (or, if less, the price at which the shares are sold) over their purchase price will be taxable as ordinary income to the participant. If there is a disqualifying disposition in the same year of exercise, it eliminates the item of adjustment for alternative minimum tax purposes. Any additional gain or loss recognized upon the disposition will be recognized as a capital gain or loss by the participant.

We will not be entitled to any tax deduction if the participant makes a qualifying disposition of ISO shares. If the participant makes a disqualifying disposition of the shares, we should be entitled to a tax deduction for compensation expense in the amount of the ordinary income recognized by the participant.

Upon exercising or settling a SAR, a 2019 Plan participant will recognize taxable income at ordinary income tax rates, and we should be entitled to a corresponding tax deduction for compensation expense, in the amount paid or value of the shares issued upon exercise or settlement. Payments in shares will be valued at the fair market value of the shares at the time of the payment, and upon the subsequent disposition of the shares the participant will recognize a short-term or long-term capital gain or loss in the amount of the difference between the sales price of the shares and the participant's tax basis in the shares.

*Restricted Stock and RSUs*. A 2019 Plan participant generally will not recognize taxable income at ordinary income tax rates and we generally will not be entitled to a tax deduction upon the grant of

restricted stock or RSUs. Upon the termination of restrictions on restricted stock or the payment of RSUs, the participant will recognize taxable income at ordinary income tax rates, and we should be entitled to a corresponding tax deduction for compensation expense, in the amount paid to the participant or the amount by which the then fair market value of the shares received by the participant exceeds the amount, if any, paid for them. Upon the subsequent disposition of any shares, the participant will recognize a short-term or long-term capital gain or loss in the amount of the difference between the sales price of the shares and the participant's tax basis in the shares. However, a 2019 Plan participant granted restricted stock that is subject to forfeiture or repurchase through a vesting schedule such that it is subject to a "risk of forfeiture" (as defined in Section 83 of the Code) may make an election under Section 83(b) of the Code to recognize taxable income at ordinary income tax rates, at the time of the grant, in an amount equal to the fair market value of the shares of common stock on the date of grant, less the amount paid, if any, for such shares. We will be entitled to a corresponding tax deduction for compensation, in the amount recognized as taxable income by the participant. If a timely Section 83(b) election is made, the participant will not recognize any additional ordinary income on the termination of restrictions on restricted stock, and we will not be entitled to any additional tax deduction.

*Other Stock or Cash-Based Awards*. A 2019 Plan participant will not recognize taxable income and we will not be entitled to a tax deduction upon the grant of other stock or cash-based awards until cash or shares are paid or distributed to the participant. At that time, any cash payments or the fair market value of shares that the participant receives will be taxable to the participant at ordinary income tax rates and we should be entitled to a corresponding tax deduction for compensation expense. Payments in shares will be valued at the fair market value of the shares at the time of the payment, and upon the subsequent disposition of the shares, the participant will recognize a short-term or long-term capital gain or loss in the amount of the difference between the sales price of the shares and the participant's tax basis in the shares.

***Existing Equity Incentive Plan***

On May 6, 2019, our board of directors and our stockholders approved the adoption of the Existing Incentive Plan.

A total of 2,231,739 shares of our common stock are reserved for issuance under the Existing Incentive Plan. As of June 30, 2019, 16,260 shares of our common stock were subject to outstanding restricted stock awards under the Existing Incentive Plan and 2,215,479 shares of our common stock remained available for future issuance under the Existing Incentive Plan. Since June 30, 2019, options to purchase a total of 1,400,528 shares of our common stock have been granted under the Existing Incentive Plan.

After the effective date of the 2019 Plan, no additional awards will be granted under the Existing Incentive Plan. However, the Existing Incentive Plan will continue to govern the terms and conditions of the outstanding awards granted under it. Shares of our common stock subject to awards granted under the Existing Incentive Plan that expire, lapse or are terminated, exchanged for cash, surrendered, repurchased or forfeited following the effective date of the Existing Incentive Plan will be available for issuance under the Existing Incentive Plan in accordance with its terms.

*Administration*. Our board of directors administers the Existing Incentive Plan, unless it delegates authority for administration of the plan. Subject to the terms and conditions of the Existing Incentive Plan, the administrator has the authority to select the persons to whom awards are to be made, to determine the type or types of awards to be granted to each person, determine the number of awards to grant, determine the number of shares to be subject to such awards, and the terms and conditions of such awards, and make all other determinations and decisions and to take all other

actions necessary or advisable for the administration of the Existing Incentive Plan. The plan administrator is also authorized to establish, adopt, amend or revise rules relating to administration of the Existing Incentive Plan, subject to certain restrictions.

*Eligibility*. Awards under the Existing Incentive Plan may be granted to individuals who are then our employees, consultants and members of our board of directors and our subsidiaries. Only employees may be granted ISOs.

*Awards*. The Existing Incentive Plan provides that our administrator may grant or issue stock options (including NSOs and ISOs), restricted stock, RSUs, other stock-based awards, or any combination thereof. The administrator considers each award grant subjectively, considering factors such as the individual performance of the recipient and the anticipated contribution of the recipient to the attainment of our long-term goals. Each award is set forth in a separate agreement with the person receiving the award and indicates the type, terms and conditions of the award.

*Corporate Transactions*. The plan administrator has broad discretion to equitably adjust the provisions of the Existing Incentive Plan and the terms and conditions of existing and future awards, including with respect to aggregate number and type of shares subject to the Existing Incentive Plan and awards granted pursuant to the Existing Incentive Plan, to prevent the dilution or enlargement of intended benefits and/or facilitate necessary or desirable changes in the event of certain transactions and events affecting our common stock, such as stock dividends, stock splits, mergers, acquisitions, consolidations and other corporate transactions. The plan administrator may also provide for the acceleration, cash-out, termination, assumption, substitution or conversion of awards in the event of a change in control or certain other unusual or nonrecurring events or transactions. In addition, in the event of certain non-reciprocal transactions with our stockholders, or an "equity restructuring," the plan administrator will make equitable adjustments to the Existing Incentive Plan and outstanding awards as it deems appropriate to reflect the equity restructuring.

In the event of a change of control where the acquirer does not assume awards granted under the Existing Incentive Plan, awards issued under the Existing Incentive Plan held by persons who have not experienced a termination of service will be subject to accelerated vesting such that 100% of the awards will become vested and exercisable or payable, as applicable, immediately prior to the change in control. Under the Existing Incentive Plan, a change of control is generally defined as: (i) a merger or consolidation of our company with or into any other corporation or other entity or person; (ii) a sale, lease, exchange or other transfer in one transaction or a series of related transactions of all or substantially all of our company's assets; or (iii) any other transaction, including the sale by us of new shares of our capital stock or a transfer of existing shares of our capital stock, the result of which is that a third party that is not an affiliate of us or our stockholders (or a group of third parties not affiliated with us or our stockholders) immediately prior to such transaction acquires or holds capital stock representing a majority of our outstanding voting power immediately following such transaction; provided that the following events shall not constitute a "change in control" under the Existing Incentive Plan: (a) a transaction (other than a sale of all or substantially all of our assets) in which the holders of our voting securities immediately prior to the merger or consolidation hold, directly or indirectly, at least a majority of the voting securities in the successor corporation or its parent immediately after the merger or consolidation; (b) a sale, lease, exchange or other transaction in one transaction or a series of related transactions of all or substantially all of our assets to an affiliate of ours; (c) an initial public offering of any of our securities or any other transaction principally for bona fide equity financing purposes; (d) a reincorporation solely to change our jurisdiction; or (e) a transaction undertaken for the primary purpose of creating a holding company that will be owned in substantially the same proportion by the persons who held our securities immediately before such transaction.

*Amendment and Termination of the Existing Incentive Plan*. Our board of directors may terminate, amend or modify the Existing Incentive Plan. However, stockholder approval of any

amendment to the Existing Incentive Plan must be obtained to the extent necessary and desirable to comply with any applicable law, regulation or stock exchange rule, or for any amendment to the Existing Incentive Plan that increases the number of shares available under the Existing Incentive Plan. If not terminated earlier by the compensation committee or the board of directors, the Existing Incentive Plan will terminate on May 6, 2029.

*Securities Laws and Federal Income Tax Consequences*. The Existing Incentive Plan is designed to comply with applicable securities laws in the same manner as described above in the description of the 2019 Plan under the heading "—2019 Incentive Award Plan—Securities Laws." The general federal tax consequences of awards under the Existing Incentive Plan are the same as those described above in the description of the 2019 Plan under the heading "—2019 Incentive Award Plan—Federal Income Tax Consequences."

***2019 Employee Stock Purchase Plan***

Our board of directors and our stockholders have approved the ESPP, which will become effective in connection with this offering. The material terms of the ESPP are summarized below.

*Shares Available; Administration.* A total of 270,000 shares of our common stock are initially reserved for issuance under our ESPP. In addition, the number of shares available for issuance under the ESPP will be annually increased on January 1 of each calendar year beginning in 2020 and ending in 2029, by an amount equal to the lesser of: (i) 1% of the shares outstanding on the final day of the immediately preceding calendar year and (ii) such smaller number of shares as is determined by our board of directors. In no event will more than 10,000,000 shares of our common stock be available for issuance under the ESPP.

Our board of directors or its committee will have authority to interpret the terms of the ESPP and determine eligibility of participants. We expect that the compensation committee will be the initial administrator of the ESPP.

*Eligibility.* Our employees are eligible to participate in the ESPP if they meet the eligibility requirements under the ESPP established from time to time by the plan administrator. However, an employee may not be granted rights to purchase stock under our ESPP if such employee, immediately after the grant, would own (directly or through attribution) stock possessing 5% or more of the total combined voting power or value of all classes of our common or other class of stock.

*Grant of Rights.* The ESPP is intended to qualify under Section 423 of the Code and stock will be offered under the ESPP during offering periods. The length of the offering periods under the ESPP will be determined by the plan administrator and may be up to 27 months long. Employee payroll deductions will be used to purchase shares on each purchase date during an offering period. The number of purchase periods within, and purchase dates during each offering period will be established by the plan administrator prior to the commencement of each offering period. Offering periods under the ESPP will commence when determined by the plan administrator. The plan administrator may, in its discretion, modify the terms of future offering periods.

The ESPP permits participants to purchase common stock through payroll deductions of up to 20% of their eligible compensation, which includes a participant's gross base compensation for services to us, including overtime payments and excluding sales commissions, incentive compensation, bonuses, expense reimbursements, fringe benefits and other special payments. The plan administrator will establish a maximum number of shares that may be purchased by a participant during any offering period or purchase period, which, in the absence of a contrary designation, will be

100,000 shares. In addition, no employee will be permitted to accrue the right to purchase stock under the ESPP at a rate in excess of $25,000 worth of shares during any calendar year during which such a purchase right is outstanding (based on the fair market value per share of our common stock as of the first day of the offering period).

On the first trading day of each offering period, each participant will automatically be granted an option to purchase shares of our common stock. The option will be exercised on the applicable purchase date(s) during the offering period, to the extent of the payroll deductions accumulated during the applicable purchase period. The purchase price of the shares, in the absence of a contrary determination by the plan administrator, will be 85% of the lower of the fair market value of our common stock on the first trading day of the offering period or on the applicable purchase date, which will be the final trading day of the applicable purchase period. Participants may voluntarily end their participation in the ESPP at any time at least one week prior to the end of the applicable offering period (or such shorter or longer period specified by the plan administrator), and will be paid their accrued payroll deductions that have not yet been used to purchase shares of common stock. Participation ends automatically upon a participant's termination of employment.

A participant may not transfer rights granted under the ESPP other than by will, the laws of descent and distribution or as otherwise provided under the ESPP.

*Certain Transactions.* In the event of certain transactions or events affecting our common stock, such as any stock dividend or other distribution, change in control, reorganization, merger, consolidation or other corporate transaction, the plan administrator will make equitable adjustments to the ESPP and outstanding rights. In addition, in the event of the foregoing transactions or events or certain significant transactions, including a change in control, the plan administrator may provide for (i) either the replacement of outstanding rights with other rights or property or termination of outstanding rights in exchange for cash, (ii) the assumption or substitution of outstanding rights by the successor or survivor corporation or parent or subsidiary thereof, if any, (iii) the adjustment in the number and type of shares of stock subject to outstanding rights, (iv) the use of participants' accumulated payroll deductions to purchase stock on a new purchase date prior to the next scheduled purchase date and termination of any rights under ongoing offering periods or (v) the termination of all outstanding rights. Under the ESPP, a change in control has the same definition as given to such term in the Existing Incentive Plan.

*Plan Amendment; Termination.* The plan administrator may amend, suspend or terminate the ESPP at any time. However, stockholder approval of any amendment to the ESPP will be obtained for any amendment which increases the aggregate number or changes the type of shares that may be sold pursuant to rights under the ESPP, changes the corporations or classes of corporations whose employees are eligible to participate in the ESPP or changes the ESPP in any manner that would cause the ESPP to no longer be an employee stock purchase plan within the meaning of Section 423(b) of the Code. The ESPP will remain in effect until terminated by our board of directors.

*Securities Laws.* The ESPP has been designed to comply with various securities laws in the same manner as described above in the description of the 2019 Plan under the heading "—2019 Incentive Award Plan—Securities Laws.".

*Federal Income Taxes.* The material federal income tax consequences of the ESPP under current federal income tax law are summarized in the following discussion, which deals with the general tax principles applicable to the ESPP. The following discussion is based upon laws, regulations, rulings and decisions now in effect, all of which are subject to change. Foreign, state and local tax laws, and employment, estate and gift tax considerations are not discussed due to the fact that they may vary depending on individual circumstances and from locality to locality.

The ESPP, and the right of participants to make purchases thereunder, is intended to qualify under the provisions of Section 423 of the Code. Under the applicable Code provisions, no income will be taxable to a participant until the sale or other disposition of the shares purchased under the ESPP. This means that an eligible employee will not recognize taxable income on the date the employee is granted an option under the ESPP (i.e., the first day of the offering period). In addition, the employee will not recognize taxable income upon the purchase of shares. Upon such sale or disposition, the participant will generally be subject to tax in an amount that depends upon the length of time such shares are held by the participant prior to disposing of them. If the shares are sold or disposed of more than two years from the first day of the offering period during which the shares were purchased and more than one year from the date of purchase, or if the participant dies while holding the shares, the participant (or his or her estate) will recognize ordinary income measured as the lesser of: (i) the excess of the fair market value of the shares at the time of such sale or disposition over the purchase price; or (ii) an amount equal to 15% of the fair market value of the shares as of the first day of the offering period. Any additional gain will be treated as long-term capital gain. If the shares are held for the holding periods described above but are sold for a price that is less than the purchase price, there is no ordinary income and the participating employee has a long-term capital loss for the difference between the sale price and the purchase price.

If the shares are sold or otherwise disposed of before the expiration of the holding periods described above, the participant will recognize ordinary income generally measured as the excess of the fair market value of the shares on the date the shares are purchased over the purchase price and we will be entitled to a tax deduction for compensation expense in the amount of ordinary income recognized by the employee. Any additional gain or loss on such sale or disposition will be long-term or short-term capital gain or loss, depending on how long the shares were held following the date they were purchased by the participant prior to disposing of them. If the shares are sold or otherwise disposed of before the expiration of the holding periods described above but are sold for a price that is less than the purchase price, the participant will recognize ordinary income equal to the excess of the fair market value of the shares on the date of purchase over the purchase price (and we will be entitled to a corresponding deduction), but the participant generally will be able to report a capital loss equal to the difference between the sales price of the shares and the fair market value of the shares on the date of purchase.

**Director Compensation**

Historically, we have not paid cash or stock-based compensation to directors for their service on our board of directors.

On January 23, 2018, YamadaCo IIA issued and sold to Dr. Yamada, 1,686,704 shares of common stock of YamadaCo IIA for a per share purchase price of $0.0002958.

On March 13, 2019, we entered into a stock restriction agreement with Dr. Yamada whereby Dr. Yamada's previously-acquired 1,686,704 shares of our common stock were subjected to new vesting conditions, such that 421,676 shares were deemed vested as of March 13, 2019 and the remaining 1,265,028 shares were converted into unvested shares of restricted stock that vest in equal monthly installments over the 48 months thereafter ending on March 13, 2023, subject, in each case, to continued employment or status as a service provider. Any unvested shares held by Dr. Yamada upon a termination of employment or service (after giving effect to any accelerated vesting provisions described further below), will be subject to repurchase by us at the original purchase price.

Under Dr. Yamada's stock restriction agreement, 100% of any unvested shares will automatically accelerate and vest upon (i) a termination of service by us without cause or by him for good reason

following a change in control, or (ii) the refusal by us to enter into a consulting agreement with him in connection with his resignation, subject to his continued employment or service through the date of such event.

The defined terms “change in control,” “cause” and “good reason” have the same meanings in Dr. Yamada’s stock restriction agreement as given to such terms in Mr. Socks’ stock restriction agreement and described above under “Executive and Director Compensation—Equity-Based Incentive Awards.”

On May 7, 2019, we entered into an offer letter with Dr. Yamada, our Chairman of the board of directors. Pursuant to Dr. Yamada’s offer letter, Dr. Yamada will be paid an annual cash fee of $100,000, paid quarterly, for his services as Chairman. Additionally, as a member of our board of directors, we will reimburse Dr. Yamada for reasonable travel and other expenses to attend board meetings and other board-related functions.

Effective August 29, 2019, we appointed Terrie Curran to our board of directors. In connection with Ms. Curran’s appointment to our board of directors, we granted to her stock options to purchase 867,200 shares of our common stock under the Existing Incentive Plan. For a description of the stock options granted to Ms. Curran, see “—Employment Letter with Terrie Curran” above.

Effective September 26, 2019, we entered into an offer letter with each of Heidi Kunz and Michael Cola in connection with their appointment to our board of directors. Pursuant to each offer letter, Ms. Kunz and Mr. Cola will be paid an annual cash retainer of $40,000, paid quarterly, which retainer will commence immediately. Additionally, as a member of our board of directors, we will reimburse Ms. Kunz and Mr. Cola for reasonable travel and other expenses to attend board meetings and other board-related functions. Pursuant to their offer letters, we also granted each of Ms. Kunz and Mr. Cola stock options to purchase 43,360 shares of our common stock. The stock options have a ten-year term and an exercise price of $13.04 per share, which our board of directors determined was equal to the fair market value per share of our common stock on the date of grant. The options will vest over a three-year period, with one-third vesting on the first anniversary of the date of grant and the remainder vesting quarterly over the 24 months thereafter, subject to continued service with us on each vesting date. Such stock options will accelerate in full upon a change in control of our company.

In connection with this offering, our board of directors and our stockholders have approved a non-employee director compensation program. The material terms of the non-employee director compensation program are summarized below.

The non-employee director compensation program will provide for annual retainer fees and/or long-term equity awards for our non-employee directors. Each non-employee director will receive an annual retainer of $40,000. Non-employee directors serving as the chairs of the audit, compensation and nominating and corporate governance committees will receive additional annual retainers of $20,000, $15,000 and $10,000, respectively. Non-employee directors serving as members of the audit, compensation and nominating and corporate governance committees will receive additional annual retainers of $10,000, $7,500 and $5,000, respectively. Additionally, the non-executive chairman of the board will receive an additional annual retainer of $40,000. The non-employee directors will also receive initial grants of options to purchase 20,000 shares of our common stock upon election to the board of directors, one-third of which will vest on the first anniversary of the grant date and the remainder of which will vest in quarterly installments over the following 24 months, and thereafter annual grants of options to purchase 10,000 shares of our common stock, vesting on the first to occur of (i) the first anniversary of the grant date or (ii) the next occurring annual meeting of our stockholders, in each case, subject to the non-employee director continuing in service on our board of directors through such vesting date.

Compensation under our non-employee director compensation program will be subject to the annual limits on non-employee director compensation set forth in the 2019 Plan, as described above. Our board of directors or its authorized committee may modify the non-employee director compensation program from time to time in the exercise of its business judgment, taking into account such factors, circumstances and considerations as it shall deem relevant from time to time, subject to the annual limit on non-employee director compensation set forth in the 2019 Plan. As provided in the 2019 Plan, our board of directors or its authorized committee may make exceptions to this limit for individual non-employee directors in extraordinary circumstances, as the board of directors or its authorized committee may determine in its discretion, provided that the non-employee director receiving such additional compensation may not participate in the decision to award such compensation or in other compensation decisions involving non-employee directors.

**Limitations of Liability and Indemnification Matters**

Our amended and restated certificate of incorporation and our amended and restated bylaws provide that we will indemnify our directors and officers to the fullest extent permitted by the Delaware General Corporation Law, which prohibits our amended and restated certificate of incorporation from limiting the liability of our directors for the following:

- any breach of the director's duty of loyalty to us or our stockholders;
- acts or omissions not in good faith or that involve intentional misconduct or a knowing violation of law;
- unlawful payment of dividends or unlawful stock repurchases or redemptions; or
- any transaction from which the director derived an improper personal benefit.

Our amended and restated certificate of incorporation and our amended and restated bylaws also provide that if Delaware law is amended to authorize corporate action further eliminating or limiting the personal liability of a director, then the liability of our directors will be eliminated or limited to the fullest extent permitted by Delaware law, as so amended. This limitation of liability does not apply to liabilities arising under the federal securities laws and does not affect the availability of equitable remedies such as injunctive relief or rescission.

Our amended and restated certificate of incorporation and our amended and restated bylaws also provide that we shall have the power to indemnify our employees and agents to the fullest extent permitted by law. Our amended and restated bylaws also permit us to secure insurance on behalf of any officer, director, employee or other agent for any liability arising out of his or her actions in this capacity, regardless of whether our amended and restated bylaws would permit indemnification. We have obtained directors' and officers' liability insurance.

We have entered into separate indemnification agreements with our directors and executive officers, in addition to indemnification provided for in our amended and restated certificate of incorporation and amended and restated bylaws. These agreements, among other things, provide for indemnification of our directors and executive officers for expenses, judgments, fines and settlement amounts incurred by this person in any action or proceeding arising out of this person's services as a director or executive officer or at our request. We believe that these provisions in our amended and restated certificate of incorporation and amended and restated bylaws and indemnification agreements are necessary to attract and retain qualified persons as directors and executive officers.

The above description of the indemnification provisions of our amended and restated certificate of incorporation, our amended and restated bylaws and our indemnification agreements is not complete and is qualified in its entirety by reference to these documents, each of which is filed as an exhibit to the registration statement of which this prospectus is a part.

The limitation of liability and indemnification provisions in our amended and restated certificate of incorporation and amended and restated bylaws may discourage stockholders from bringing a lawsuit against directors for breach of their fiduciary duties. They may also reduce the likelihood of derivative litigation against directors and officers, even though an action, if successful, might benefit us and our stockholders. A stockholder's investment may be harmed to the extent we pay the costs of settlement and damage awards against directors and officers pursuant to these indemnification provisions. Insofar as indemnification for liabilities under the Securities Act may be permitted to directors, officers or persons controlling us pursuant to the foregoing provisions, we have been informed that in the opinion of the SEC such indemnification is against public policy as expressed in the Securities Act and is therefore unenforceable. There is no pending litigation or proceeding naming any of our directors or officers as to which indemnification is being sought, nor are we aware of any pending or threatened litigation that may result in claims for indemnification by any director or officer.

## CERTAIN RELATIONSHIPS AND RELATED PERSON TRANSACTIONS

The following includes a summary of transactions since our inception to which we have been a party in which the amount involved exceeded or will exceed the lesser of $120,000 and one percent of the average of our total assets at year-end for the last two completed fiscal years, and in which any of our directors, executive officers or, to our knowledge, beneficial owners of more than 5% of our capital stock or any member of the immediate family of any of the foregoing persons had or will have a direct or indirect material interest, other than equity and other compensation, termination, change in control and other arrangements, which are described under “Executive and Director Compensation.” The transactions below also include transactions of YamadaCo IIA, Inc. prior to the Merger. We also describe below certain other transactions with our directors, executive officers and stockholders.

### Convertible Promissory Note Financings

*Prior Convertible Promissory Note Financings with Frazier Life Sciences IX, L.P.*

In January 2018, YamadaCo IIA, Inc. entered into a convertible promissory note purchase agreement with Frazier Life Sciences IX, L.P., or FLS IX, pursuant to which from January 2018 to December 2018 YamadaCo IIA issued and sold to FLS IX three convertible promissory notes, or the YamadaCo Notes, in the aggregate principal amount of $1.5 million. The YamadaCo Notes accrued interest at the then applicable federal rate (1.68%, 2.38% and 2.55%, respectively) per annum, and were due and payable upon demand by FLS IX nine months from the date of issuance, subject to earlier conversion or repayment in the event YamadaCo IIA completed an equity financing or a change of control.

In January 2018, we entered into a convertible promissory note purchase agreement with FLS IX, pursuant to which from January 2018 to April 2019, we issued and sold to FLS IX three convertible promissory notes, or the Phathom Notes, in the aggregate principal amount of $0.9 million. The Phathom Notes accrued interest at the then applicable federal rate (1.68%, 2.42% and 2.52%, respectively) per annum, and were due and payable upon demand by FLS IX nine months from the date of issuance, subject to earlier conversion or repayment in the event we completed an equity financing or a change of control.

The YamadaCo Notes and Phathom Notes, in the aggregate amount of $2.4 million, including accrued interest thereon, were cancelled and exchanged for May 2019 Notes issued in the May 2019 convertible note financing described below.

The general partner of FLS IX is FHMLS IX, L.P., and the general partner of FHMLS IX, L.P. is FHMLS IX, L.L.C. James Topper, M.D., Ph.D., a member of our board of directors, is one of the managing members of FHMLS IX, L.L.C.

*May 2019 Convertible Promissory Note Financing*

In May 2019, we entered into a convertible promissory note purchase agreement with certain investors, or the 2019 Note Purchase Agreement, pursuant to which in May 2019 we issued and sold to such investors convertible promissory notes, or the May 2019 Notes, in the aggregate principal amount of approximately $90.3 million. The May 2019 Notes accrue interest at a rate of 6% per annum and become payable upon demand of the holders of at least 60% of the outstanding principal amount of the May 2019 Notes one year from the date of issuance, subject to earlier conversion or repayment in the event we complete an equity financing or a change of control. We have not paid any interest on the May 2019 Notes to date. The participants in this May 2019 Note financing included the following 5% or greater stockholders and or entities affiliated with members of our board of directors.

| Participants | Aggregate Principal Amount of May 2019 Notes |
|---|---|
| Frazier Life Sciences IX, L.P.(1) | $ 20,000,000 |
| Entities affiliated with Medicxi Growth(2) | $ 15,000,000 |

(1) Consists of convertible promissory notes held by FLS IX, or the Frazier May 2019 Notes. Additional details regarding FLS IX and its equity holdings are provided under the section titled “Principal Stockholders.” James Topper, M.D., Ph.D., a member of our board of directors, is one of the managing members of FHMLS IX, L.L.C, which is an affiliate of FLS IX.

(2) Consists of convertible promissory notes, or the Medicxi Notes, held by Medicxi Growth I LP and Medicxi Growth Co-Invest I LP, collectively Medicxi Growth. Jonathan Edwards, Ph.D., a member of our board of directors, is a Partner of Medicxi, an affiliate of Medicxi Growth.

The outstanding principal and unpaid accrued interested due on the Frazier May 2019 Notes and the Medicxi Notes will automatically convert into an aggregate of 1,353,423 shares and 1,015,067 shares of our common stock, respectively, immediately prior to the closing of this offering, each based on an assumed initial public offering price of $19.00 per share, the midpoint of the price range set forth on the cover page of this prospectus, and assuming the conversion occurs on October 28, 2019.

The May 2019 Notes are subordinated to borrowings under our Loan Agreement with Silicon Valley Bank and WestRiver Innovation Lending Fund VIII, L.P.

**Investor Rights Under the 2019 Note Purchase Agreement**

*Registration Rights*

The 2019 Note Purchase Agreement provides FLS IX, Takeda, and all holders of the May 2019 Notes with specified registration rights relating to the registration of shares of common stock held by such entities, including shares of our common stock issuable upon conversion of the May 2019 Notes and shares of our common stock issuable upon the exercise or conversion of any securities exercisable or convertible into shares of our common stock.

The registration rights terminate upon the earlier of: (i) five years after the closing of this offering or (ii) with respect to a particular holder, such time at which such holder can sell all shares held by it in compliance with Rule 144 under the Securities Act.

See the section titled “Description of Capital Stock—Registration Rights” for more information regarding these registration rights.

*Voting Rights*

The 2019 Note Purchase Agreement provides for rights relating to the election of members to serve on our board of directors. Pursuant to the 2019 Note Purchase Agreement, as amended in

September 2019, the following directors were each elected to serve as members on our board of directors and, as of the date of this prospectus, continue to so serve: David Socks, Tadataka Yamada, M.D., Michael F. Cola, Terrie Curran, Jonathan Edwards, Ph.D., Heidi Kunz, Chris Slavinsky, and James Topper, M.D., Ph.D. Mr. Socks, our President and Chief Executive Officer, was initially selected to serve on our board of directors in his role as Chief Executive Officer. Dr. Yamada was initially selected to serve on our board of directors as a representative of holders of our common stock, as designated by a majority of our common stockholders. Dr. Topper was initially selected to serve on our board of directors as a representative of holders of our common stock, as designated by FLS IX. Dr. Edwards was initially selected to serve on our board of directors as a representative of the holders of the May 2019 Notes. Mr. Cola, Ms. Curran, Ms. Kunz, and Mr. Slavinsky were initially selected to serve on our board of directors as representatives of holders of our common stock, with Mr. Slavinsky being designated by Takeda.

The 2019 Note Purchase Agreement provides that Takeda may designate a member to serve on our board of directors as a representative of holders of our common stock, provided that such right does not apply at any time the board of directors consists of fewer than five individuals that are not affiliated with Takeda. In connection with our appointment of Ms. Curran to our board of directors in August 2019, at which time we had five directors serving on our board, we also appointed Mr. Slavinsky to our board pursuant this right.

The voting rights provisions of the 2019 Note Purchase Agreement will terminate upon the closing of this offering, and members previously elected to our board of directors pursuant to this agreement will continue to serve as directors until they resign, are removed or their successors are duly elected by holders of our common stock. The composition of our board of directors after this offering is described in more detail under “Management—Board Composition and Election of Directors.”

*Other Rights*

The 2019 Note Purchase Agreement provides certain holders of our May 2019 Notes with various additional rights including, among others, information rights, pre-emptive rights, drag along rights, rights of first refusal, co-sale rights, and certain additional covenants made by us. Except as set forth above, all rights under the 2019 Note Purchase Agreement will terminate upon the closing of this offering.

**Takeda Agreements**

*License Agreement and Clinical Manufacturing and Supply Agreement*

On May 7, 2019, we and Takeda, one of our 5% stockholders, entered into the Takeda License and a clinical manufacturing and supply agreement. Such agreements are described in “Business—Intellectual Property—License Agreement with Takeda Pharmaceutical Company Limited.”

In connection with the Takeda License, we (i) entered into a Stock Issuance Agreement with Takeda, pursuant to which we issued Takeda 1,084,000 shares of our common stock, (ii) issued the Takeda Warrant to purchase 7,588,000 shares of common stock at an exercise price of $0.00004613 per share and (iii) granted the Takeda Warrant Right, pursuant to which Takeda has a right to receive an additional common stock warrant upon the closing of this offering if Takeda’s fully-diluted ownership represents less than a specified percentage of our fully-diluted capitalization, including shares issuable upon conversion of outstanding convertible promissory notes, calculated immediately prior to the closing of this offering, each as partial consideration under the Takeda License. The Takeda Warrant expires ten years from its date of issuance, subject to its earlier termination upon the completion of certain mergers, acquisitions and similar transactions. The Takeda Warrant Right will expire upon the

closing of this offering based on an assumed initial public offering price of $19.00 per share, the midpoint of the price range set forth on the cover of this prospectus. See the section titled “Description of Capital Stock—Warrants” for more information regarding the Takeda Warrant and the Takeda Warrant Right. In connection with the Takeda License, we provided Takeda with various investor rights, including pre-emptive rights, drag along rights, voting rights and certain registration rights. See “—Investor Rights Under the 2019 Note Purchase Agreement” above for more information regarding these voting rights and registration rights.

**Merger**

*Initial Founder Equity Issuances*

On January 23, 2018, YamadaCo IIA issued and sold to Tadataka Yamada, M.D., our Chairman, 1,686,704 shares of YamadaCo IIA common stock at a purchase price of $0.0002958 per share, after giving effect to the merger described below. On February 14, 2018, YamadaCo IIA issued and sold to FLS IX 1,693,463 shares of YamadaCo IIA common stock at a purchase price of $0.0002958 per share, after giving effect to the merger described below.

On February 13, 2018, we issued and sold to David Socks, our President and Chief Executive Officer and a member of our board of directors, 1,686,704 shares of our common stock at a purchase price of $0.0002958 per share. On February 14, 2018, we issued and sold to FLS IX 1,693,463 shares of our common stock at a purchase price of $0.0002958 per share.

On March 13, 2019, we entered into stock restriction agreements with each of Mr. Socks and Dr. Yamada providing for vesting and a company right to repurchase the unvested shares held by Mr. Socks and Dr. Yamada upon the occurrence of certain events.

For more information regarding these stock issuances to Dr. Yamada and Mr. Socks, see the section in this prospectus entitled “Executive and Director Compensation—Equity-Based Incentive Awards” and “Executive and Director Compensation—Narrative Disclosure to Summary Compensation Table—Director Compensation.”

*Merger Agreement*

On March 13, 2019, YamadaCo IIA merged with and into our company, with our company surviving the merger, or the Merger. Immediately prior to the Merger, we effected a 1,559.1183-for-1 forward stock split for each outstanding share of our common stock. Effective upon the closing of the Merger, each issued and outstanding share of YamadaCo IIA was converted into 1,559.1183 shares of our common stock.

*Additional Equity Issuances*

Following the Merger, on March 13, 2019, we issued and sold to FLS IX 1,491,072 shares of our common stock at a purchase price of $0.0002958 per share.

**Additional Executive Officer Equity Issuances**

Following the Merger, on March 13, 2019, we issued and sold to each of Azmi Nabulsi, M.D., M.P.H., our Chief Operating Officer, and Aditya Kohli, Ph.D., our Chief Business Officer, 867,200 and 843,352 shares of our common stock, respectively, at a purchase price of $0.0002958 per share.

**Shared Operating Expenses**

Frazier is a principal stockholder of our company and is represented on our board of directors.

For the year ended December 31, 2018 and the six months ended June 30, 2019, we conducted our operations within office space controlled by Frazier and Frazier allocated a portion of the costs associated with this office to us. In addition, Frazier paid for various goods and services, such as employee wages, insurance and expense reimbursements and various administrative services associated with our operations and charged us for those expenses. For the year ended December 31, 2018 and the six months ended June 30, 2018 and 2019, we incurred $0.3 million, $0.1 million and $0.1 million, respectively, of shared operating expenses.

**Employment Arrangements**

We have entered into employment letter agreements with our executive officers. For more information regarding these employment agreements, see the section in this prospectus entitled “Executive and Director Compensation—Employment Letters with our Executive Officers.”

**Director and Officer Indemnification**

We have entered into indemnification agreements with each of our directors and executive officers. These agreements, among other things, require us or will require us to indemnify each director (and in certain cases their related venture capital funds) and executive officer to the fullest extent permitted by Delaware law, including indemnification of expenses such as attorneys’ fees, judgments, fines and settlement amounts incurred by the director or executive officer in any action or proceeding, including any action or proceeding by or in right of us, arising out of the person’s services as a director or executive officer.

Our amended and restated certificate of incorporation and our amended and restated bylaws provide that we will indemnify each of our directors and officers to the fullest extent permitted by the Delaware General Corporation Law. Further, we have purchased a policy of directors’ and officers’ liability insurance that insures our directors and officers against the cost of defense, settlement or payment of a judgment under certain circumstances. For further information, see “Executive and Director Compensation—Limitations of Liability and Indemnification Matters.”

**Directed Share Program**

At our request, the underwriters have reserved up to 3.0% of the shares of common stock to be offered by this prospectus for sale, at the initial public offering price, to certain of our directors, officers, employees, and their friends and family members through a directed share program. We do not currently know whether any of our directors, officers, or their affiliates, or holders of more than 5% of our common stock will purchase more than $120,000 in value of such reserved shares of our common stock in this offering. See “Underwriting—Directed Share Program.”

**Policies and Procedures for Related Person Transactions**

Our board of directors has adopted a written related person transaction policy, to be effective upon the closing of this offering, setting forth the policies and procedures for the review and approval or ratification of related-person transactions. This policy will cover, with certain exceptions set forth in Item 404 of Regulation S-K under the Securities Act, any transaction, arrangement or relationship, or any series of similar transactions, arrangements or relationships in which we were or are to be a participant, where the amount involved exceeds $120,000, and a related person had or will have a

direct or indirect material interest, including, without limitation, purchases of goods or services by or from the related person or entities in which the related person has a material interest, indebtedness, guarantees of indebtedness and employment by us of a related person. In reviewing and approving any such transactions, our audit committee is tasked to consider all relevant facts and circumstances, including, but not limited to, whether the transaction is on terms comparable to those that could be obtained in an arm's length transaction and the extent of the related person's interest in the transaction. All of the transactions described in this section occurred prior to the adoption of this policy.

## PRINCIPAL STOCKHOLDERS

The following table sets forth information with respect to the beneficial ownership of our common stock as of September 30, 2019, and as adjusted to reflect the sale of shares of common stock in this offering, by:

- our named executive officer;
- each of our directors;
- all of our executive officers and directors as a group; and
- each person or group of affiliated persons known by us to beneficially own more than 5% of our common stock.

The number of shares beneficially owned by each stockholder is determined under rules issued by the SEC. Under these rules, beneficial ownership includes any shares as to which a person has sole or shared voting power or investment power. Applicable percentage ownership prior to this offering is based on 11,876,518 shares of common stock outstanding on September 30, 2019, which includes 4,455,525 shares subject to forfeiture or a right of repurchase. Applicable percentage ownership after this offering is based on the sale of 7,900,000 shares of common stock in this offering and gives effect to the automatic conversion of the May 2019 Notes into an aggregate of 6,106,940 shares of our common stock immediately prior to the closing of this offering (based on an assumed initial public offering price of $19.00 per share, the midpoint of the price range set forth on the cover page of this prospectus, and assuming the conversion occurs on October 28, 2019). In computing the number of shares beneficially owned by a person and the percentage ownership of that person, shares of common stock subject to options, warrants or other rights held by such person that are currently exercisable or will become exercisable within 60 days of September 30, 2019 are considered outstanding, although these shares are not considered outstanding for purposes of computing the percentage ownership of any other person.

Unless otherwise indicated, the address of each beneficial owner listed below is c/o Phathom Pharmaceuticals, Inc., 2150 E. Lake Cook Road, Suite 800, Buffalo Grove, Illinois 60089. We believe, based on information provided to us, that each of the stockholders listed below has sole voting and investment power with respect to the shares beneficially owned by the stockholder unless noted otherwise, subject to community property laws where applicable.

| Name of Beneficial Owner | Beneficial Ownership Prior to this Offering | | Beneficial Ownership After this Offering | |
|---|---|---|---|---|
| | Number | Percent | Number | Percent |
| **5% or Greater Stockholders** | | | | |
| Takeda Pharmaceutical Company Limited(1) | 1,084,000 | 9.1% | 8,672,000 | 25.9% |
| Frazier Life Sciences IX, L.P.(2) | 4,877,998 | 41.1% | 6,231,421 | 24.1% |
| **Executive Officers and Directors** | | | | |
| David Socks(3) | 1,686,704 | 14.2% | 1,686,704 | 6.5% |
| Tadataka Yamada, M.D.(4) | 1,686,704 | 14.2% | 1,686,704 | 6.5% |
| Michael F. Cola | — | * | — | * |
| Terrie Curran | — | * | — | * |
| Azmi Nabulsi, M.D., M.P.H.(5) | 867,200 | 7.3% | 867,200 | 3.4% |
| Aditya Kohli, Ph.D.(6) | 843,352 | 7.1% | 843,352 | 3.3% |
| James Topper, M.D., Ph.D.(2) | 4,877,998 | 41.1% | 6,231,421 | 24.1% |
| Jonathan Edwards, Ph.D | — | * | — | * |
| Heidi Kunz | — | * | — | * |
| Chris Slavinsky | — | * | — | * |
| All executive officers and directors as a group (10 persons)(7) | 9,961,958 | 83.9% | 11,315,381 | 43.7% |

* Less than 1%.

(1) The number of shares beneficially owned before the offering does not include 7,588,000 shares of common stock issuable upon exercise of the Takeda Warrant, which becomes exerciseable upon the closing of this offering. The number of shares beneficially owned after the offering includes 7,588,000 shares of common stock issuable upon the exercise of the Takeda Warrant. The address for Takeda Pharmaceutical Company Limited is 1-1, Doshomachi 4-chome, Chuo-ku, Osaka 540-8645, Japan.

(2) The shares are held directly by Frazier Life Sciences IX, L.P., or FLS IX. The general partner of FLS IX is FHMLS IX, L.P., and the general partner of FHMLS IX, L.P. is FHMLS IX, L.L.C. James Topper, M.D., Ph.D., and Patrick Heron are the sole managing members of FHMLS IX, L.L.C. and share voting and investment power of the securities held by FLS IX. Dr. Topper and Mr. Heron disclaim beneficial ownership of such securities except to the extent of their pecuniary interest therein. The number of shares beneficially owned after the offering includes 1,353,423 shares of common stock issuable upon the conversion of May 2019 Notes in the aggregate principal amount of $20,000,000 plus accrued interest held by Frazier Life Sciences IX, L.P. immediately prior to the closing of this offering (based on an assumed initial public offering price of $19.00 per share, the midpoint of the price range set forth on the cover page of this prospectus, and assuming the conversion occurs on October 28, 2019). The address for FLS IX is 601 Union Street, Suite 3200, Seattle, WA 98101.

(3) Consists of 1,686,704 shares of common stock held by the David A. Socks 2013 Revocable Trust, 1,106,900 of which were subject to a right of repurchase by us as of September 30, 2019. David Socks is a trustee of the David A. Socks 2013 Revocable Trust and in such capacity has the sole power to vote and dispose of such shares.

(4) Consists of 1,686,704 shares of common stock held by Dr. Yamada, 1,106,900 of which were subject to a right of repurchase by us as of September 30, 2019.

(5) Consists of 867,200 shares of common stock held by Dr. Nabulsi, all of which were subject to a right of repurchase by us as of September 30, 2019,

(6) Consists of 843,352 shares of common stock held by Dr. Kohli, 553,450 of which were subject to a right of repurchase by us as of September 30, 2019.

(7) Consists of the shares held by the executive officers and directors described in footnotes 2 through 6 above.

## DESCRIPTION OF CAPITAL STOCK

### General

The following description summarizes some of the terms of our amended and restated certificate of incorporation and amended and restated bylaws and of the Delaware General Corporation Law. Because it is only a summary, it does not contain all the information that may be important to you. For a complete description you should refer to our amended and restated certificate of incorporation and amended and restated bylaws, copies of which have been filed as exhibits to the registration statement of which the prospectus is a part.

Following the closing of this offering, our authorized capital stock will consist of 400,000,000 shares of common stock, $0.0001 par value per share, and 40,000,000 shares of preferred stock, $0.0001 par value per share.

### Common Stock

As of June 30, 2019, there were 11,876,518 shares of our common stock outstanding, including 4,657,250 shares of restricted common stock which are subject to forfeiture or our right of repurchase as of June 30, 2019, and held of record by 20 stockholders. Based on the number of shares of common stock outstanding as of June 30, 2019, and assuming (i) the automatic conversion of the May 2019 Notes into an aggregate of 6,106,940 shares of our common stock immediately prior to the closing of this offering (based on an assumed initial public offering price of $19.00 per share, the midpoint of the price range set forth on the cover page of this prospectus, and assuming the conversion occurs on October 28, 2019) and (ii) the issuance by us of 7,900,000 shares of common stock in this offering, there will be 25,883,458 shares of common stock outstanding upon the closing of this offering. Holders of our common stock are entitled to one vote for each share held on all matters submitted to a vote of stockholders, including the election of directors, and do not have cumulative voting rights. Accordingly, the holders of a majority of the outstanding shares of common stock entitled to vote in any election of directors can elect all of the directors standing for election, if they so choose, other than any directors that holders of any preferred stock we may issue may be entitled to elect. Subject to the supermajority votes for some matters, other matters shall be decided by the affirmative vote of our stockholders having a majority in voting power of the votes cast by the stockholders present or represented and voting on such matter. Our amended and restated certificate of incorporation and amended and restated bylaws also provide that our directors may be removed only for cause and only by the affirmative vote of the holders of at least two-thirds in voting power of the outstanding shares of capital stock entitled to vote thereon. In addition, the affirmative vote of the holders of at least two-thirds in voting power of the outstanding shares of capital stock entitled to vote thereon is required to amend or repeal, or to adopt any provision inconsistent with, several of the provisions of our amended and restated certificate of incorporation. See below under “—Anti-Takeover Effects of Delaware Law and Our Certificate of Incorporation and Bylaws—Amendment of Charter Provisions.”

Subject to preferences that may be applicable to any then outstanding preferred stock, holders of common stock are entitled to receive ratably those dividends, if any, as may be declared by the board of directors out of legally available funds. In the event of our liquidation, dissolution or winding up, the holders of common stock will be entitled to share ratably in the assets legally available for distribution to stockholders after the payment of or provision for all of our debts and other liabilities, subject to the prior rights of any preferred stock then outstanding. Holders of common stock have no preemptive or conversion rights or other subscription rights and there are no redemption or sinking funds provisions applicable to the common stock. All outstanding shares of common stock are, and the common stock to be outstanding upon the closing of this offering will be, duly authorized, validly issued, fully paid and nonassessable. The rights, preferences and privileges of holders of common stock are subject to and

may be adversely affected by the rights of the holders of shares of any series of preferred stock that we may designate and issue in the future.

**Preferred Stock**

As of the date of this prospectus, we do not have shares of preferred stock authorized or outstanding. Under the terms of our amended and restated certificate of incorporation, which will become effective immediately prior to the closing of this offering, our board of directors has the authority, without further action by our stockholders, to issue up to 40,000,000 shares of preferred stock in one or more series, to establish from time to time the number of shares to be included in each such series, to fix the dividend, voting and other rights, preferences and privileges of the shares of each wholly unissued series and any qualifications, limitations or restrictions thereon, and to increase or decrease the number of shares of any such series, but not below the number of shares of such series then outstanding.

Our board of directors may authorize the issuance of preferred stock with voting or conversion rights that could adversely affect the voting power or other rights of the holders of the common stock. The issuance of preferred stock, while providing flexibility in connection with possible acquisitions and other corporate purposes, could, among other things, have the effect of delaying, deterring or preventing a change in our control and may adversely affect the market price of the common stock and the voting and other rights of the holders of common stock. We have no current plans to issue any shares of preferred stock.

**Warrants**

In May 2019, in connection with the Takeda License, we issued the Takeda Warrant to purchase 7,588,000 shares of our common stock with an exercise price of $0.00004613 per share. The Takeda Warrant contains a net exercise provision under which Takeda may, in lieu of payment of the exercise price in cash, surrender the warrant and receive a net amount of shares of our common stock based on the fair market value of our common stock at the time of the net exercise of the warrant after deduction of the aggregate exercise price. The Takeda Warrant expires ten years from its date of issuance, subject to its earlier termination upon the completion of certain mergers, acquisitions and similar transactions.

In May 2019, in connection with the Takeda License, we granted to Takeda the Takeda Warrant Right, pursuant to which Takeda has a right to right to receive an additional common stock warrant should Takeda's fully-diluted ownership represent less than a certain specified percentage of our fully-diluted capitalization, including shares issuable upon conversion of the outstanding May 2019 Notes in connection with this offering, calculated immediately prior to the closing of this offering. The Takeda Warrant Right will expire upon the closing of this offering (based on an assumed initial public offering price of $19.00 per share, the midpoint of the price range set forth on the cover of this prospectus).

In May 2019, in connection with the entry into the Loan Agreement, we issued to the lenders the Lender Warrants to purchase an aggregate of 16,446 shares of our common stock with an exercise price equal to $15.20 per share (based on an assumed initial public offering price of $19.00 per share, the midpoint of the price range set forth on the cover page of this prospectus). The Lender Warrants only become exercisable if and when we borrow Term Loan B under our Loan Agreement. The Lender Warrants expire ten years from the date of issuance, subject to their earlier termination on September 30, 2020 if we do not draw down on Term Loan B on or before March 31, 2020. The Lender Warrants also include a put option pursuant to which, in the event that we do not draw down on Term Loan B on or before March 31, 2020, the lenders may require us to repurchase the Lender Warrants for a total aggregate repurchase price of $500,000.

## Registration Rights

As of June 30, 2019, upon the closing of this offering holders of 12,068,938 shares of our common stock, which includes all of the shares of common stock issuable upon the automatic conversion of the May 2019 Notes, or their transferees, will be entitled to the following rights with respect to the registration of such shares for public resale under the Securities Act, pursuant to the 2019 Note Purchase Agreement by and among us and certain investors. In addition, upon the closing of this offering Takeda will be entitled to the same rights with respect to the registration of 7,588,000 shares of our common stock underlying the Takeda Warrant. The registration of shares of common stock as a result of the following rights being exercised would enable holders to trade these shares without restriction under the Securities Act when the applicable registration statement is declared effective.

### *Demand Registration Rights*

*Form S-1.* If at any time beginning six months following the effective date of the registration statement of which this prospectus forms a part, the holders of at least 25% of the registrable securities request in writing that we effect a registration with respect to all or a part of the registrable securities then outstanding where the price to the public of the offering is $10.0 million or more, we may be required to provide notice to all holders of registrable securities and to use commercially reasonable efforts to effect such registration; provided, however, that we will not be required to effect such a registration if, within the preceding 12 months, we have already effected two registrations for the holders of registrable securities in response to these demand registration rights, subject to certain exceptions.

*Form S-3.* If at any time we become entitled under the Securities Act to register our shares on Form S-3, the holders of at least 20% of the registrable securities request in writing that we effect a registration with respect to all or a part of the registrable securities then outstanding where the price to the public of the offering is $3.0 million or more, we may be required to provide notice to all holders of registrable securities and to use commercially reasonable efforts to effect such registration; provided, however, that we will not be required to effect such a registration if, within the preceding 12 months, we have already effected two registrations on Form S-3 for the holders of registrable securities.

If the holders requesting registration intend to distribute their shares by means of an underwriting, the underwriter of such offering will have the right to limit the numbers of shares to be underwritten for reasons related to the marketing of the shares.

### *Piggyback Registration Rights*

If at any time following the closing of this offering we propose to register any shares of our common stock under the Securities Act, subject to certain exceptions, the holders of registrable securities will be entitled to notice of the registration and to include their shares of registrable securities in the registration. If our proposed registration involves an underwriting, the managing underwriter of such offering will have the right to limit the number of shares to be underwritten for reasons related to the marketing of the shares.

### *Indemnification*

The 2019 Note Purchase Agreement contains customary cross indemnification provisions, under which we are obligated to indemnify holders of registrable securities in the event of material misstatements or omissions in a registration statement attributable to us, and they are obligated to indemnify us for material misstatements or omissions attributable to them.

***Expenses***

Ordinarily, other than underwriting discounts and commissions, we will be required to pay all expenses incurred by us related to any registration effected pursuant to the exercise of these registration rights. These expenses may include all registration and filing fees, printing expenses, fees and disbursements of our counsel, reasonable fees and disbursements of a counsel for the selling securityholders, blue sky fees and expenses and the expenses of any special audits incident to the registration.

***Termination of Registration Rights***

The registration rights terminate upon the earlier of: (i) five years after the closing of this offering or (ii) with respect to a particular holder, such time at which such holder can sell all shares held by it in compliance with Rule 144 under the Securities Act.

**Anti-Takeover Effects of Delaware Law and Our Certificate of Incorporation and Bylaws**

Some provisions of Delaware law, our amended and restated certificate of incorporation and our amended and restated bylaws contain provisions that could make the following transactions more difficult: an acquisition of us by means of a tender offer; an acquisition of us by means of a proxy contest or otherwise; or the removal of our incumbent officers and directors. It is possible that these provisions could make it more difficult to accomplish or could deter transactions that stockholders may otherwise consider to be in their best interest or in our best interests, including transactions which provide for payment of a premium over the market price for our shares.

These provisions, summarized below, are intended to discourage coercive takeover practices and inadequate takeover bids. These provisions are also designed to encourage persons seeking to acquire control of us to first negotiate with our board of directors. We believe that the benefits of the increased protection of our potential ability to negotiate with the proponent of an unfriendly or unsolicited proposal to acquire or restructure us outweigh the disadvantages of discouraging these proposals because negotiation of these proposals could result in an improvement of their terms.

***Undesignated Preferred Stock***

The ability of our board of directors, without action by the stockholders, to issue up to 40,000,000 shares of undesignated preferred stock with voting or other rights or preferences as designated by our board of directors could impede the success of any attempt to change control of us. These and other provisions may have the effect of deferring hostile takeovers or delaying changes in control or management of our company.

***Stockholder Meetings***

Our amended and restated bylaws provide that a special meeting of stockholders may be called only by our chairman of the board of directors, chief executive officer or president, or by a resolution adopted by a majority of our board of directors.

***Requirements for Advance Notification of Stockholder Nominations and Proposals***

Our amended and restated bylaws establish advance notice procedures with respect to stockholder proposals to be brought before a stockholder meeting and the nomination of candidates for election as directors, other than nominations made by or at the direction of the board of directors or a committee of the board of directors.

***Elimination of Stockholder Action by Written Consent***

Our amended and restated certificate of incorporation and amended and restated bylaws eliminate the right of stockholders to act by written consent without a meeting.

***Staggered Board of Directors***

Our board of directors is divided into three classes. The directors in each class will serve for a three-year term, one class being elected each year by our stockholders. For more information on the classified board of directors, see “Management—Board Composition and Election of Directors.” This system of electing and removing directors may tend to discourage a third party from attempting to obtain control of us, because it generally makes it more difficult for stockholders to replace a majority of the directors.

***Removal of Directors***

Our amended and restated certificate of incorporation provides that no member of our board of directors may be removed from office except for cause and, in addition to any other vote required by law, upon the approval of not less than two thirds of the total voting power of all of our outstanding voting stock then entitled to vote in the election of directors.

***Stockholders Not Entitled to Cumulative Voting***

Our amended and restated certificate of incorporation does not permit stockholders to cumulate their votes in the election of directors. Accordingly, the holders of a majority of the outstanding shares of our common stock entitled to vote in any election of directors can elect all of the directors standing for election, if they choose, other than any directors that holders of our preferred stock may be entitled to elect.

***Delaware Anti-Takeover Statute***

We are subject to Section 203 of the Delaware General Corporation Law, which prohibits persons deemed to be “interested stockholders” from engaging in a “business combination” with a publicly held Delaware corporation for three years following the date these persons become interested stockholders unless the business combination is, or the transaction in which the person became an interested stockholder was, approved in a prescribed manner or another prescribed exception applies. Generally, an “interested stockholder” is a person who, together with affiliates and associates, owns, or within three years prior to the determination of interested stockholder status did own, 15% or more of a corporation’s voting stock. Generally, a “business combination” includes a merger, asset or stock sale, or other transaction resulting in a financial benefit to the interested stockholder. The existence of this provision may have an anti-takeover effect with respect to transactions not approved in advance by the board of directors.

***Choice of Forum***

Our amended and restated certificate of incorporation provides that, unless we consent in writing to the selection of an alternative form, the Court of Chancery of the State of Delaware will be the sole and exclusive forum under Delaware statutory or common law: (i) any derivative action or proceeding brought on our behalf; (ii) any action asserting a claim of breach of a fiduciary duty or other wrongdoing by any of our directors, officers, employees or agents to us or our stockholders, creditors or other constituents; (iii) any action asserting a claim against us arising pursuant to any provision of the General Corporation Law of the State of Delaware or our amended and restated certificate of

incorporation or amended and restated bylaws; (iv) any action to interpret, apply, enforce or determine the validity of our certificate of incorporation or bylaws; or (v) any action asserting a claim governed by the internal affairs doctrine. The provision would not apply to suits brought to enforce a duty or liability created by the Securities Act or the Exchange Act, or any other claim for which the federal courts have exclusive jurisdiction. To the extent that any such claims may be based upon federal law claims, Section 27 of the Exchange Act creates exclusive federal jurisdiction over all suits brought to enforce any duty or liability created by the Exchange Act or the rules and regulations thereunder. Furthermore, Section 22 of the Securities Act creates concurrent jurisdiction for federal and state courts over all suits brought to enforce any duty or liability created by the Securities Act or the rules and regulations thereunder. In any case, stockholders will not be deemed to have waived our compliance with the federal securities laws and the rules and regulations thereunder. The enforceability of similar choice of forum provisions in other companies' certificates of incorporation has been challenged in legal proceedings, and it is possible that a court could find these types of provisions to be inapplicable or unenforceable. Our amended and restated certificate of incorporation also provides that any person or entity purchasing or otherwise acquiring any interest in shares of our capital stock will be deemed to have notice of and to have consented to this choice of forum provision.

***Amendment of Charter Provisions***

The amendment of any of the above provisions, except for the provision making it possible for our board of directors to issue preferred stock, would require approval by holders of at least two thirds of the total voting power of all of our outstanding voting stock.

The provisions of Delaware law, our amended and restated certificate of incorporation and our amended and restated bylaws could have the effect of discouraging others from attempting hostile takeovers and, as a consequence, they may also inhibit temporary fluctuations in the market price of our common stock that often result from actual or rumored hostile takeover attempts. These provisions may also have the effect of preventing changes in the composition of our board of directors and management. It is possible that these provisions could make it more difficult to accomplish transactions that stockholders may otherwise deem to be in their best interests.

**Transfer Agent and Registrar**

The transfer agent and registrar for our common stock will be Computershare Trust Company, N.A. The transfer agent and registrar's address is 250 Royall Street, Canton, Massachusetts 02021.

**The Nasdaq Global Market Listing**

We have applied to have our common stock listed on the Nasdaq Global Market under the symbol "PHAT."

**Limitations of Liability and Indemnification Matters**

For a discussion of liability and indemnification, see "Executive and Director Compensation—Limitations of Liability and Indemnification Matters."

## SHARES ELIGIBLE FOR FUTURE SALE

Immediately prior to this offering, there was no public market for our common stock. Future sales of substantial amounts of common stock in the public market, or the perception that such sales may occur, could adversely affect the market price of our common stock. Although we have applied to have our common stock listed on the Nasdaq Global Market, we cannot assure you that there will be an active public market for our common stock.

Based on the number of shares of our common stock outstanding as of June 30, 2019, and assuming (i) the issuance of 7,900,000 shares in this offering, (ii) the automatic conversion of the May 2019 Notes into an aggregate of 6,106,940 shares of our common stock immediately prior to the closing of this offering (based on an assumed initial public offering price of $19.00 per share, the midpoint of the price range set forth on the cover page of this prospectus, and assuming the conversion occurs on October 28, 2019), (iii) no exercise of the underwriters' option to purchase additional shares of common stock, and (iv) no exercise of outstanding options, warrants, or other rights we will have outstanding an aggregate of 25,883,458 shares of common stock.

Of these shares, all shares sold in this offering will be freely tradable without restriction or further registration under the Securities Act, except for any shares purchased by our "affiliates," as that term is defined in Rule 144 under the Securities Act. Shares purchased by our affiliates would be subject to the Rule 144 resale restrictions described below, other than the holding period requirement.

The remaining 17,983,458 shares of common stock will be "restricted securities," as that term is defined in Rule 144 under the Securities Act. These restricted securities are eligible for public sale only if they are registered under the Securities Act or if they qualify for an exemption from registration under Rule 144 or 701 under the Securities Act, each of which is summarized below. We expect that substantially all of these shares will be subject to the 180-day lock-up period under the lock-up agreements described below.

In addition, 7,588,000 shares of common stock issuable to Takeda upon the exercise of the Takeda Warrant will become exercisable upon the closing of this offering. Upon exercise of the Takeda Warrant, these shares of common stock will be eligible for sale subject to the lock–up agreements described below and Rules 144 and 701 under the Securities Act.

### Lock-Up Agreements

We, our officers, directors and holders of substantially all of our securities, have agreed with the underwriters that for a period of 180 days, after the date of this prospectus, subject to specified exceptions, we or they will not offer, pledge, sell, contract to sell, sell any option or contract to purchase, purchase any option or contract to sell, grant any option, right or warrant to sale of, or otherwise dispose of or transfer any shares of common stock or any securities convertible into or exercisable or exchangeable for shares of common stock, request or demand that we file a registration statement related to our common stock or enter into any swap or other agreement that transfers to another, in whole or in part, directly or indirectly, the economic consequence of ownership of the common stock. Upon expiration of the lock-up period, certain of our stockholders will have the right to require us to register their shares under the Securities Act. See "—Registration Rights" below and "Description of Capital Stock—Registration Rights."

Goldman Sachs & Co. LLC, Jefferies LLC, and Evercore Group L.L.C. may, in their sole discretion and at any time or from time to time before the termination of the lock-up period, in certain cases without public notice, release all or any portion of the securities subject to lock-up agreements. There are no existing agreements between the underwriters and any of our stockholders who will

execute a lock-up agreement providing consent to the sale of shares prior to the expiration of the lock-up period.

Upon the expiration of the lock-up period, substantially all of the shares subject to such lock-up restrictions will become eligible for sale, subject to the limitations discussed above.

**Rule 10b5-1 Trading Plans**

Following the closing of this offering, certain of our officers, directors and significant stockholders may adopt written plans, known as Rule 10b5-1 trading plans, in which they will contract with a broker to buy or sell shares of our common stock on a periodic basis to diversify their assets and investments. Under these 10b5-1 trading plans, a broker may execute trades pursuant to parameters established by the officer, director or stockholder when entering into the plan, without further direction from such officer, director or stockholder. Such sales would not commence until the expiration of the applicable lock-up agreements entered into by such officer, director or stockholder in connection with this offering.

**Rule 144**

***Affiliate Resales of Restricted Securities***

In general, beginning 90 days after the effective date of the registration statement of which this prospectus is a part, a person who is an affiliate of ours, or who was an affiliate at any time during the 90 days before a sale, who has beneficially owned shares of our common stock for at least six months would be entitled to sell in “broker’s transactions” or certain “riskless principal transactions” or to market makers, a number of shares within any three-month period that does not exceed the greater of:

- 1% of the number of shares of our common stock then outstanding, which will equal approximately 258,834 shares immediately after this offering; or
- the average weekly trading volume in our common stock on the Nasdaq Global Market during the four calendar weeks preceding the filing of a notice on Form 144 with respect to such sale.

Affiliate resales under Rule 144 are also subject to the availability of current public information about us. In addition, if the number of shares being sold under Rule 144 by an affiliate during any three-month period exceeds 5,000 shares or has an aggregate sale price in excess of $50,000, the seller must file a notice on Form 144 with the SEC and the Nasdaq Global Market concurrently with either the placing of a sale order with the broker or the execution of a sale directly with a market maker.

***Non-Affiliate Resales of Restricted Securities***

In general, beginning 90 days after the effective date of the registration statement of which this prospectus is a part, a person who is not an affiliate of ours at the time of sale, and has not been an affiliate at any time during the three months preceding a sale, and who has beneficially owned shares of our common stock for at least six months but less than a year, is entitled to sell such shares subject only to the availability of current public information about us. If such person has held our shares for at least one year, such person can resell under Rule 144(b)(1) without regard to any Rule 144 restrictions, including the 90-day public company requirement and the current public information requirement.

Non-affiliate resales are not subject to the manner of sale, volume limitation or notice filing provisions of Rule 144.

**Rule 701**

In general, under Rule 701, any of an issuer’s employees, directors, officers, consultants or advisors who purchases shares from the issuer in connection with a compensatory stock or option plan

or other written agreement before the effective date of a registration statement under the Securities Act is entitled to sell such shares 90 days after such effective date in reliance on Rule 144. An affiliate of the issuer can resell shares in reliance on Rule 144 without having to comply with the holding period requirement, and non-affiliates of the issuer can resell shares in reliance on Rule 144 without having to comply with the current public information and holding period requirements.

**Equity Plans**

We intend to file one or more registration statements on Form S-8 under the Securities Act to register all shares of common stock subject to outstanding stock options and common stock issued or issuable under our equity incentive plans and employee stock purchase plan. We expect to file the registration statement covering shares offered pursuant to these stock plans shortly after the date of this prospectus, permitting the resale of such shares by non-affiliates in the public market without restriction under the Securities Act and the sale by affiliates in the public market subject to compliance with the resale provisions of Rule 144.

**Registration Rights**

As of June 30, 2019, upon the closing of this offering holders of 12,068,938 shares of our common stock, which includes all of the shares of common stock issuable upon the automatic conversion of the May 2019 Notes, or their transferees will be entitled to various rights with respect to the registration of these shares under the Securities Act. In addition, upon the closing of this offering, Takeda will be entitled to the same rights with respect to the registration of 7,588,000 shares of our common stock underlying the Takeda Warrant. Registration of these shares under the Securities Act would result in these shares becoming fully tradable without restriction under the Securities Act immediately upon the effectiveness of the registration. See “Description of Capital Stock—Registration Rights” for additional information. Shares covered by a registration statement will be eligible for sale in the public market upon the expiration or release from the terms of the lock-up agreement.

## MATERIAL UNITED STATES FEDERAL INCOME TAX CONSEQUENCES TO NON-U.S. HOLDERS

The following discussion is a summary of the material U.S. federal income tax consequences to Non-U.S. Holders (as defined below) of the purchase, ownership and disposition of our common stock issued pursuant to this offering, but does not purport to be a complete analysis of all potential tax effects. The effects of other U.S. federal tax laws, such as estate and gift tax laws, and any applicable state, local or non-U.S. tax laws are not discussed. This discussion is based on the U.S. Internal Revenue Code of 1986, as amended, or the Code, Treasury Regulations promulgated thereunder, judicial decisions, and published rulings and administrative pronouncements of the U.S. Internal Revenue Service, or the IRS, in each case in effect as of the date hereof. These authorities may change or be subject to differing interpretations. Any such change or differing interpretation may be applied retroactively in a manner that could adversely affect a Non-U.S. Holder of our common stock. We have not sought and will not seek any rulings from the IRS regarding the matters discussed below. There can be no assurance the IRS or a court will not take a contrary position to that discussed below regarding the tax consequences of the purchase, ownership and disposition of our common stock.

This discussion is limited to Non-U.S. Holders that hold our common stock as a "capital asset" within the meaning of Section 1221 of the Code (generally, property held for investment). This discussion does not address all U.S. federal income tax consequences relevant to a Non-U.S. Holder's particular circumstances, including the impact of the alternative minimum tax or the Medicare contribution tax on net investment income. In addition, it does not address consequences relevant to Non-U.S. Holders subject to special rules, including, without limitation:

- U.S. expatriates and former citizens or long-term residents of the United States;
- persons holding our common stock as part of a hedge, straddle or other risk reduction strategy or as part of a conversion transaction or other integrated investment;
- banks, insurance companies, and other financial institutions;
- brokers, dealers or traders in securities;
- "controlled foreign corporations," "passive foreign investment companies," and corporations that accumulate earnings to avoid U.S. federal income tax;
- partnerships or other entities or arrangements treated as partnerships for U.S. federal income tax purposes (and investors therein);
- tax-exempt organizations or governmental organizations;
- persons deemed to sell our common stock under the constructive sale provisions of the Code;
- persons who hold or receive our common stock pursuant to the exercise of any employee stock option or otherwise as compensation;
- persons subject to special tax accounting rules as a result of any item of gross income with respect to our common stock being taken into account in an "applicable financial statement" (as defined in the Code);
- tax-qualified retirement plans; and
- "qualified foreign pension funds" as defined in Section 897(l)(2) of the Code and entities all of the interests of which are held by qualified foreign pension funds.

If an entity treated as a partnership for U.S. federal income tax purposes holds our common stock, the tax treatment of a partner in the partnership will depend on the status of the partner, the activities of the partnership and certain determinations made at the partner level. Accordingly, partnerships holding our common stock and the partners in such partnerships should consult their tax advisors regarding the U.S. federal income tax consequences to them.

**THIS DISCUSSION IS FOR INFORMATION PURPOSES ONLY AND IS NOT TAX ADVICE. INVESTORS SHOULD CONSULT THEIR TAX ADVISORS WITH RESPECT TO THE APPLICATION OF THE U.S. FEDERAL INCOME TAX LAWS TO THEIR PARTICULAR SITUATIONS AS WELL AS ANY TAX CONSEQUENCES OF THE PURCHASE, OWNERSHIP AND DISPOSITION OF OUR COMMON STOCK ARISING UNDER THE U.S. FEDERAL ESTATE OR GIFT TAX LAWS OR UNDER THE LAWS OF ANY STATE, LOCAL OR NON-U.S. TAXING JURISDICTION OR UNDER ANY APPLICABLE INCOME TAX TREATY.**

### Definition of a Non-U.S. Holder

For purposes of this discussion, a "Non-U.S. Holder" is any beneficial owner of our common stock that is neither a "U.S. person" nor an entity treated as a partnership for U.S. federal income tax purposes. A U.S. person is any person that, for U.S. federal income tax purposes, is or is treated as any of the following:

- an individual who is a citizen or resident of the United States;
- a corporation created or organized under the laws of the United States, any state thereof, or the District of Columbia;
- an estate, the income of which is subject to U.S. federal income tax regardless of its source; or
- a trust that (i) is subject to the primary supervision of a U.S. court and the control of one or more "United States persons" (within the meaning of Section 7701(a)(30) of the Code), or (ii) has a valid election in effect to be treated as a United States person for U.S. federal income tax purposes.

### Distributions

As described in the section entitled "Dividend Policy," we do not anticipate declaring or paying dividends to holders of our common stock in the foreseeable future. However, if we do make distributions of cash or property on our common stock, such distributions will constitute dividends for U.S. federal income tax purposes to the extent paid from our current or accumulated earnings and profits, as determined under U.S. federal income tax principles. Amounts not treated as dividends for U.S. federal income tax purposes will constitute a return of capital and first be applied against and reduce a Non-U.S. Holder's adjusted tax basis in its common stock, but not below zero. Any excess will be treated as capital gain and will be treated as described below under "—Sale or Other Taxable Disposition."

Subject to the discussion below on effectively connected income, dividends paid to a Non-U.S. Holder of our common stock will be subject to U.S. federal withholding tax at a rate of 30% of the gross amount of the dividends (or such lower rate specified by an applicable income tax treaty, provided the Non-U.S. Holder furnishes a valid IRS Form W-8BEN or W-8BEN-E (or other applicable documentation) certifying qualification for the lower treaty rate). If a Non-U.S. Holder holds the stock through a financial institution or other agent acting on the Non-U.S. Holder's behalf, the Non-U.S. Holder will be required to provide appropriate documentation to the agent, who then will be required to provide certification to the applicable withholding agent, either directly or through other intermediaries. A Non-U.S. Holder that does not timely furnish the required documentation, but that qualifies for a reduced treaty rate, may obtain a refund of any excess amounts withheld by timely filing an appropriate claim for refund with the IRS. Non-U.S. Holders should consult their tax advisors regarding their entitlement to benefits under any applicable income tax treaty.

If dividends paid to a Non-U.S. Holder are effectively connected with the Non-U.S. Holder's conduct of a trade or business within the United States (and, if required by an applicable income tax

treaty, the Non-U.S. Holder maintains a permanent establishment in the United States to which such dividends are attributable), the Non-U.S. Holder will be exempt from the U.S. federal withholding tax described above. To claim the exemption, the Non-U.S. Holder must furnish to the applicable withholding agent a valid IRS Form W-8ECI, certifying that the dividends are effectively connected with the Non-U.S. Holder's conduct of a trade or business within the United States.

Any such effectively connected dividends will be subject to U.S. federal income tax on a net income basis at the regular rates. A Non-U.S. Holder that is a corporation also may be subject to a branch profits tax at a rate of 30% (or such lower rate specified by an applicable income tax treaty) on such effectively connected dividends, as adjusted for certain items. Non-U.S. Holders should consult their tax advisors regarding any applicable tax treaties that may provide for different rules.

**Sale or Other Taxable Disposition**

A Non-U.S. Holder will not be subject to U.S. federal income tax on any gain realized upon the sale or other taxable disposition of our common stock unless:

- the gain is effectively connected with the Non-U.S. Holder's conduct of a trade or business within the United States (and, if required by an applicable income tax treaty, the Non-U.S. Holder maintains a permanent establishment in the United States to which such gain is attributable);
- the Non-U.S. Holder is a nonresident alien individual present in the United States for 183 days or more during the taxable year of the disposition and certain other requirements are met; or
- our common stock constitutes a U.S. real property interest, or USRPI, by reason of our status as a U.S. real property holding corporation, or USRPHC, for U.S. federal income tax purposes.

Gain described in the first bullet point above generally will be subject to U.S. federal income tax on a net income basis at the regular rates. A Non-U.S. Holder that is a corporation also may be subject to a branch profits tax at a rate of 30% (or such lower rate specified by an applicable income tax treaty) on such effectively connected gain, as adjusted for certain items.

Gain described in the second bullet point above will be subject to U.S. federal income tax at a rate of 30% (or such lower rate specified by an applicable income tax treaty), which may be offset by U.S. source capital losses of the Non-U.S. Holder (even though the Non-U.S. Holder is not considered a resident of the United States), provided the Non-U.S. Holder has timely filed U.S. federal income tax returns with respect to such losses.

With respect to the third bullet point above, we believe we currently are not, and do not anticipate becoming, a USRPHC. Because the determination of whether we are a USRPHC depends, however, on the fair market value of our USRPIs relative to the fair market value of our non-U.S. real property interests and our other business assets, there can be no assurance we currently are not a USRPHC or will not become one in the future. Even if we are or were to become a USRPHC, gain arising from the sale or other taxable disposition by a Non-U.S. Holder of our common stock will not be subject to U.S. federal income tax if our common stock is "regularly traded," as defined by applicable Treasury Regulations, on an established securities market, and such Non-U.S. Holder owned, actually or constructively, 5% or less of our common stock throughout the shorter of the five-year period ending on the date of the sale or other taxable disposition or the Non-U.S. Holder's holding period. If we are a USRPHC and either our common stock is not regularly traded on an established securities market or a Non-U.S. Holder holds, or is treated as holding, more than 5% of our outstanding common stock, directly or indirectly, during the applicable testing period, such Non-U.S. Holder will generally be taxed on any gain in the same manner as gain that is effectively connected with the conduct of a U.S. trade

or business, except that the branch profits tax generally will not apply. If we are a USRPHC and our common stock is not regularly traded on an established securities market, a Non-U.S. Holder's proceeds received on the disposition of shares will also generally be subject to withholding at a rate of 15%. Prospective investors are encouraged to consult their own tax advisors regarding the possible consequences to them if we are, or were to become, a USRPHC.

Non-U.S. Holders should consult their tax advisors regarding potentially applicable income tax treaties that may provide for different rules.

**Information Reporting and Backup Withholding**

Payments of dividends on our common stock will not be subject to backup withholding, provided the applicable withholding agent does not have actual knowledge or reason to know the holder is a United States person and the holder either certifies its non-U.S. status, such as by furnishing a valid IRS Form W-8BEN, W-8BEN-E or W-8ECI, or otherwise establishes an exemption. However, information returns are required to be filed with the IRS in connection with any dividends on our common stock paid to the Non-U.S. Holder, regardless of whether any tax was actually withheld. In addition, proceeds of the sale or other taxable disposition of our common stock within the United States or conducted through certain U.S.-related brokers generally will not be subject to backup withholding or information reporting, if the applicable withholding agent receives the certification described above and does not have actual knowledge or reason to know that such holder is a United States person, or the holder otherwise establishes an exemption. Proceeds of a disposition of our common stock conducted through a non-U.S. office of a non-U.S. broker generally will not be subject to backup withholding or information reporting.

Copies of information returns that are filed with the IRS may also be made available under the provisions of an applicable treaty or agreement to the tax authorities of the country in which the Non-U.S. Holder resides or is established.

Backup withholding is not an additional tax. Any amounts withheld under the backup withholding rules may be allowed as a refund or a credit against a Non-U.S. Holder's U.S. federal income tax liability, provided the required information is timely furnished to the IRS.

**Additional Withholding Tax on Payments Made to Foreign Accounts**

Withholding taxes may be imposed under Sections 1471 to 1474 of the Code (such Sections are commonly referred to as the Foreign Account Tax Compliance Act, or FATCA) on certain types of payments made to non-U.S. financial institutions and certain other non-U.S. entities. Specifically, a 30% withholding tax may be imposed on dividends on, or subject to the proposed Treasury Regulations discussed below, gross proceeds from the sale or other disposition of, our common stock paid to a "foreign financial institution" or a "non-financial foreign entity" (each as defined in the Code), unless (i) the foreign financial institution undertakes certain diligence and reporting obligations, (ii) the non-financial foreign entity either certifies it does not have any "substantial United States owners" (as defined in the Code) or furnishes identifying information regarding each substantial United States owner, or (iii) the foreign financial institution or non-financial foreign entity otherwise qualifies for an exemption from these rules. If the payee is a foreign financial institution and is subject to the diligence and reporting requirements in clause (i) above, it must enter into an agreement with the U.S. Department of the Treasury requiring, among other things, that it undertake to identify accounts held by certain "specified United States persons" or "United States owned foreign entities" (each as defined in the Code), annually report certain information about such accounts, and withhold 30% on certain payments to non-compliant foreign financial institutions and certain other account holders. Foreign financial institutions located in jurisdictions that have an intergovernmental agreement with the United States governing FATCA may be subject to different rules.

Under the applicable Treasury Regulations and administrative guidance, withholding under FATCA generally applies to payments of dividends on our common stock. While withholding under FATCA would also have applied to payments of gross proceeds from the sale or other disposition of stock on or after January 1, 2019, recently proposed Treasury Regulations eliminate FATCA withholding on payments of gross proceeds entirely. Taxpayers generally may rely on these proposed Treasury Regulations until final Treasury Regulations are issued.

Prospective investors should consult their tax advisors regarding the potential application of withholding under FATCA to their investment in our common stock.

## UNDERWRITING

We and the underwriters named below have entered into an underwriting agreement with respect to the shares being offered. Subject to certain conditions, each underwriter has severally agreed to purchase the number of shares indicated in the following table. Goldman Sachs & Co. LLC, Jefferies LLC, and Evercore Group L.L.C. are the representatives of the underwriters.

| Underwriters | Number of Shares |
|---|---|
| Goldman Sachs & Co. LLC | |
| Jefferies LLC | |
| Evercore Group L.L.C. | |
| Needham & Company, LLC | |
| Total | 7,900,000 |

The underwriters are committed to take and pay for all of the shares being offered, if any are taken, other than the shares covered by the option described below unless and until this option is exercised.

The underwriters have an option to buy up to an additional 1,185,000 shares from us to cover sales by the underwriters of a greater number of shares than the total number set forth in the table above. They may exercise that option for 30 days. If any shares are purchased pursuant to this option, the underwriters will severally purchase shares in approximately the same proportion as set forth in the table above.

The following table shows the per share and total underwriting discounts and commissions to be paid to the underwriters by us. Such amounts are shown assuming both no exercise and full exercise of the underwriters' option to purchase 1,185,000 additional shares.

| | No Exercise | Full Exercise |
|---|---|---|
| Per Share | $ | $ |
| Total | $ | $ |

Shares sold by the underwriters to the public will initially be offered at the initial public offering price set forth on the cover page of this prospectus. Any shares sold by the underwriters to securities dealers may be sold at a discount of up to $ per share from the initial public offering price. After the initial offering of the shares, the representatives may change the offering price and the other selling terms. The offering of the shares by the underwriters is subject to receipt and acceptance and subject to the underwriters' right to reject any order in whole or in part.

We and our officers, directors, and holders of substantially all of our securities have agreed with the underwriters, subject to certain exceptions, not to dispose of or hedge any of their common stock or securities convertible into or exchangeable for shares of common stock during the period from the date of this prospectus continuing through the date 180 days after the date of this prospectus, except with the prior written consent of the representatives. This agreement does not apply to any existing employee benefit plans. See "Shares Eligible for Future Sale" for a discussion of certain transfer restrictions.

Prior to the offering, there has been no public market for the shares. The initial public offering price will be negotiated among our company and the representatives. Among the factors to be considered in determining the initial public offering price of the shares, in addition to prevailing market

conditions, will be our historical performance, estimates of our business potential and earnings prospects, an assessment of our management and the consideration of the above factors in relation to market valuation of companies in related businesses.

We have applied to have our common stock listed on the Nasdaq Global Market under the symbol “PHAT.”

In connection with the offering, the underwriters may purchase and sell shares of our common stock in the open market. These transactions may include short sales, stabilizing transactions and purchases to cover positions created by short sales. Short sales involve the sale by the underwriters of a greater number of shares than they are required to purchase in the offering, and a short position represents the amount of such sales that have not been covered by subsequent purchases. A “covered short position” is a short position that is not greater than the amount of additional shares for which the underwriters’ option described above may be exercised. The underwriters may cover any covered short position by either exercising their option to purchase additional shares or purchasing shares in the open market. In determining the source of shares to cover the covered short position, the underwriters will consider, among other things, the price of shares available for purchase in the open market as compared to the price at which they may purchase additional shares pursuant to the option described above. “Naked” short sales are any short sales that create a short position greater than the amount of additional shares for which the option described above may be exercised. The underwriters must cover any such naked short position by purchasing shares in the open market. A naked short position is more likely to be created if the underwriters are concerned that there may be downward pressure on the price of the common stock in the open market after pricing that could adversely affect investors who purchase in the offering. Stabilizing transactions consist of various bids for or purchases of common stock made by the underwriters in the open market prior to the completion of the offering.

The underwriters may also impose a penalty bid. This occurs when a particular underwriter repays to the underwriters a portion of the underwriting discount received by it because the representatives have repurchased shares sold by or for the account of such underwriter in stabilizing or short covering transactions.

Purchases to cover a short position and stabilizing transactions, as well as other purchases by the underwriters for their own accounts, may have the effect of preventing or retarding a decline in the market price of our stock, and together with the imposition of the penalty bid, may stabilize, maintain or otherwise affect the market price of the common stock. As a result, the price of the common stock may be higher than the price that otherwise might exist in the open market. The underwriters are not required to engage in these activities and may end any of these activities at any time. These transactions may be effected on the Nasdaq Global Market, in the OTC market or otherwise.

We estimate that our share of the total expenses of the offering, excluding underwriting discounts and commissions, will be approximately $2.8 million. We have also agreed to reimburse the underwriters for certain expenses incurred by them in connection with the offering in an amount up to $40,000.

We have agreed to indemnify the several underwriters against certain liabilities, including liabilities under the Securities Act.

At our request, the underwriters have reserved up to 3.0% of the shares of common stock to be offered by this prospectus for sale, at the initial public offering price, to certain of our directors, officers, employees, and their friends and family members through a directed share program. Goldman Sachs & Co. LLC will administer our directed share program. The number of shares available for sale to the general public in the offering will be reduced to the extent these persons purchase the reserved shares. Any reserved shares not so purchased will be offered by the underwriters to the general public

on the same terms as the other shares offered by this prospectus. The underwriters will receive the same discount from such reserved shares as they will from other shares of our common stock sold to the public in this offering. We have agreed to indemnify the underwriters against certain liabilities and expenses, including liabilities under the Securities Act, in connection with sales of the reserved shares.

The underwriters and their respective affiliates are full service financial institutions engaged in various activities, which may include sales and trading, commercial and investment banking, advisory, investment management, investment research, principal investment, hedging, market making, brokerage and other financial and non-financial activities and services. Certain of the underwriters and their respective affiliates have provided, and may in the future provide, a variety of these services to the issuer and to persons and entities with relationships with the issuer, for which they received or will receive customary fees and expenses.

In the ordinary course of their various business activities, the underwriters and their respective affiliates, officers, directors and employees may purchase, sell or hold a broad array of investments and actively trade securities, derivatives, loans, commodities, currencies, credit default swaps and other financial instruments for their own account and for the accounts of their customers, and such investment and trading activities may involve or relate to assets, securities and/or instruments of the issuer (directly, as collateral securing other obligations or otherwise) and/or persons and entities with relationships with the issuer. The underwriters and their respective affiliates may also communicate independent investment recommendations, market color or trading ideas and/or publish or express independent research views in respect of such assets, securities or instruments and may at any time hold, or recommend to clients that they should acquire, long and/or short positions in such assets, securities and instruments.

**European Economic Area**

In relation to each Member State of the European Economic Area (each a “Member State”), no shares of common stock (the “Shares”) have been offered or will be offered pursuant to the offering to the public in that Member State prior to the publication of a prospectus in relation to the Shares which has been approved by the competent authority in that Member State or, where appropriate, approved in another Member State and notified to the competent authority in that Member State, all in accordance with the Prospectus Regulation), except that offers of Shares may be made to the public in that Member State at any time under the following exemptions under the Prospectus Regulation:

(a) to any legal entity which is a qualified investor as defined under the Prospectus Regulation;

(b) to fewer than 150 natural or legal persons (other than qualified investors as defined under the Prospectus Regulation), subject to obtaining the prior consent of the representatives for any such offer; or

(c) in any other circumstances falling within Article 1(4) of the Prospectus Regulation,

provided that no such offer of Shares shall require the company or any underwriter to publish a prospectus pursuant to Article 3 of the Prospectus Regulation or supplement a prospectus pursuant to Article 23 of the Prospectus Regulation.

For the purposes of this provision, the expression an “offer to the public” in relation to any Shares in any Member State means the communication in any form and by any means of sufficient information on the terms of the offer and any Shares to be offered so as to enable an investor to decide to purchase or subscribe for any Shares, and the expression “Prospectus Regulation” means Regulation (EU) 2017/1129.

**United Kingdom**

Each Underwriter has represented and agreed that:

(a) it has only communicated or caused to be communicated and will only communicate or cause to be communicated an invitation or inducement to engage in investment activity (within the meaning of Section 21 of the Financial Services and Markets Act 2000 (FSMA)) received by it in connection with the issue or sale of the Shares in circumstances in which Section 21(1) of the FSMA does not apply to the company or the underwriter; and

(b) it has complied and will comply with all applicable provisions of the FSMA with respect to anything done by it in relation to the Shares in, from or otherwise involving the United Kingdom.

**Canada**

The securities may be sold in Canada only to purchasers purchasing, or deemed to be purchasing, as principal that are accredited investors, as defined in National Instrument 45-106 Prospectus Exemptions or subsection 73.3(1) of the Securities Act (Ontario), and are permitted clients, as defined in National Instrument 31-103 Registration Requirements, Exemptions, and Ongoing Registrant Obligations. Any resale of the securities must be made in accordance with an exemption form, or in a transaction not subject to, the prospectus requirements of applicable securities laws.

Securities legislation in certain provinces or territories of Canada may provide a purchaser with remedies for rescission or damages if this prospectus (including any amendment thereto) contains a misrepresentation, provided that the remedies for rescission or damages are exercised by the purchaser within the time limit prescribed by the securities legislation of the purchaser's province or territory. The purchaser should refer to any applicable provisions of the securities legislation of the purchaser's province or territory of these rights or consult with a legal advisor.

Pursuant to section 3A.3 of National Instrument 33-105 Underwriting Conflicts (NI 33-105), the underwriters are not required to comply with the disclosure requirements of NI 33-105 regarding underwriter conflicts of interest in connection with this offering.

**Hong Kong**

The shares may not be offered or sold in Hong Kong by means of any document other than (i) in circumstances which do not constitute an offer to the public within the meaning of the Companies (Winding Up and Miscellaneous Provisions) Ordinance (Cap. 32 of the Laws of Hong Kong) ("Companies (Winding Up and Miscellaneous Provisions) Ordinance") or which do not constitute an invitation to the public within the meaning of the Securities and Futures Ordinance (Cap. 571 of the Laws of Hong Kong) ("Securities and Futures Ordinance"), or (ii) to "professional investors" as defined in the Securities and Futures Ordinance and any rules made thereunder, or (iii) in other circumstances which do not result in the document being a "prospectus" as defined in the Companies (Winding Up and Miscellaneous Provisions) Ordinance, and no advertisement, invitation or document relating to the shares may be issued or may be in the possession of any person for the purpose of issue (in each case whether in Hong Kong or elsewhere), which is directed at, or the contents of which are likely to be accessed or read by, the public in Hong Kong (except if permitted to do so under the securities laws of Hong Kong) other than with respect to shares which are or are intended to be disposed of only to persons outside Hong Kong or only to "professional investors" in Hong Kong as defined in the Securities and Futures Ordinance and any rules made thereunder.

**Singapore**

This prospectus has not been registered as a prospectus with the Monetary Authority of Singapore. Accordingly, this prospectus and any other document or material in connection with the offer or sale, or invitation for subscription or purchase, of the shares may not be circulated or distributed, nor may the shares be offered or sold, or be made the subject of an invitation for subscription or purchase, whether directly or indirectly, to persons in Singapore other than (i) to an institutional investor (as defined under Section 4A of the Securities and Futures Act, Chapter 289 of Singapore (the "SFA")) under Section 274 of the SFA, (ii) to a relevant person (as defined in Section 275(2) of the SFA) pursuant to Section 275(1) of the SFA, or any person pursuant to Section 275(1A) of the SFA, and in accordance with the conditions specified in Section 275 of the SFA or (iii) otherwise pursuant to, and in accordance with the conditions of, any other applicable provision of the SFA, in each case subject to conditions set forth in the SFA.

Where the shares are subscribed or purchased under Section 275 of the SFA by a relevant person which is a corporation (which is not an accredited investor (as defined in Section 4A of the SFA)) the sole business of which is to hold investments and the entire share capital of which is owned by one or more individuals, each of whom is an accredited investor, the securities (as defined in Section 239(1) of the SFA) of that corporation shall not be transferable for 6 months after that corporation has acquired the shares under Section 275 of the SFA except: (i) to an institutional investor under Section 274 of the SFA or to a relevant person (as defined in Section 275(2) of the SFA), (ii) where such transfer arises from an offer in that corporation's securities pursuant to Section 275(1A) of the SFA, (iii) where no consideration is or will be given for the transfer, (iv) where the transfer is by operation of law, (v) as specified in Section 276(7) of the SFA, or (vi) as specified in Regulation 32 of the Securities and Futures (Offers of Investments) (Shares and Debentures) Regulations 2005 of Singapore ("Regulation 32").

Where the shares are subscribed or purchased under Section 275 of the SFA by a relevant person which is a trust (where the trustee is not an accredited investor (as defined in Section 4A of the SFA)) whose sole purpose is to hold investments and each beneficiary of the trust is an accredited investor, the beneficiaries' rights and interest (howsoever described) in that trust shall not be transferable for 6 months after that trust has acquired the shares under Section 275 of the SFA except: (i) to an institutional investor under Section 274 of the SFA or to a relevant person (as defined in Section 275(2) of the SFA), (ii) where such transfer arises from an offer that is made on terms that such rights or interest are acquired at a consideration of not less than S$200,000 (or its equivalent in a foreign currency) for each transaction (whether such amount is to be paid for in cash or by exchange of securities or other assets), (iii) where no consideration is or will be given for the transfer, (iv) where the transfer is by operation of law, (v) as specified in Section 276(7) of the SFA, or (vi) as specified in Regulation 32.

**Japan**

The securities have not been and will not be registered under the Financial Instruments and Exchange Act of Japan (Act No. 25 of 1948, as amended), or the FIEA. The securities may not be offered or sold, directly or indirectly, in Japan or to or for the benefit of any resident of Japan (including any person resident in Japan or any corporation or other entity organized under the laws of Japan) or to others for reoffering or resale, directly or indirectly, in Japan or to or for the benefit of any resident of Japan, except pursuant to an exemption from the registration requirements of the FIEA and otherwise in compliance with any relevant laws and regulations of Japan.

**Australia**

This prospectus is not a disclosure document for the purposes of Australia's Corporations Act 2001 (Cth) of Australia, or Corporations Act, has not been lodged with the Australian Securities &

Investments Commission and is only directed to the categories of exempt persons set out below. Accordingly, if you receive this prospectus in Australia:

You confirm and warrant that you are either:

- a “sophisticated investor” under section 708(8)(a) or (b) of the Corporations Act;
- a “sophisticated investor” under section 708(8)(c) or (d) of the Corporations Act and that you have provided an accountant’s certificate to the Company which complies with the requirements of section 708(8)(c)(i) or (ii) of the Corporations Act and related regulations before the offer has been made;
- a person associated with the Company under Section 708(12) of the Corporations Act; or
- a “professional investor” within the meaning of section 708(11)(a) or (b) of the Corporations Act.

To the extent that you are unable to confirm or warrant that you are an exempt sophisticated investor, associated person or professional investor under the Corporations Act any offer made to you under this prospectus is void and incapable of acceptance.

You warrant and agree that you will not offer any of the securities issued to you pursuant to this prospectus for resale in Australia within 12 months of those securities being issued unless any such resale offer is exempt from the requirement to issue a disclosure document under section 708 of the Corporations Act.

**Israel**

This document does not constitute a prospectus under the Israeli Securities Law, 5728-1968, or the Securities Law, and has not been filed with or approved by the Israel Securities Authority. In Israel, this prospectus is being distributed only to, and is directed only at, and any offer of the shares is directed only at, (i) a limited number of persons in accordance with the Israeli Securities Law and (ii) investors listed in the first addendum, or the Addendum, to the Israeli Securities Law, consisting primarily of joint investment in trust funds, provident funds, insurance companies, banks, portfolio managers, investment advisors, members of the Tel Aviv Stock Exchange, underwriters, venture capital funds, entities with equity in excess of NIS 50 million and “qualified individuals,” each as defined in the Addendum (as it may be amended from time to time), collectively referred to as qualified investors (in each case, purchasing for their own account or, where permitted under the Addendum, for the accounts of their clients who are investors listed in the Addendum). Qualified investors are required to submit written confirmation that they fall within the scope of the Addendum, are aware of the meaning of same and agree to it.

**Switzerland**

The securities may not be publicly offered in Switzerland and will not be listed on the SIX Swiss Exchange (“SIX”) or on any other stock exchange or regulated trading facility in Switzerland. This prospectus has been prepared without regard to the disclosure standards for issuance prospectuses under art. 652a or art. 1156 of the Swiss Code of Obligations or the disclosure standards for listing prospectuses under art. 27 ff. of the SIX Listing Rules or the listing rules of any other stock exchange or regulated trading facility in Switzerland. Neither this prospectus nor any other offering or marketing material relating to the securities or the offering may be publicly distributed or otherwise made publicly available in Switzerland.

Neither this prospectus nor any other offering or marketing material relating to the offering, our company or the securities have been or will be filed with or approved by any Swiss regulatory authority.

In particular, this prospectus will not be filed with, and the offer of securities will not be supervised by, the Swiss Financial Market Supervisory Authority FINMA, and the offer of securities has not been and will not be authorized under the Swiss Federal Act on Collective Investment Schemes ("CISA"). The investor protection afforded to acquirers of interests in collective investment schemes under the CISA does not extend to acquirers of securities.

## LEGAL MATTERS

The validity of the shares of common stock offered hereby will be passed upon for us by Latham & Watkins LLP, San Diego, California. The underwriters are being represented by Cooley LLP, San Diego, California.

## EXPERTS

Ernst & Young LLP, independent registered public accounting firm, has audited our combined financial statements at December 31, 2018 and for the year then ended, as set forth in their report (which contains an explanatory paragraph describing conditions that raise substantial doubt about Phathom Pharmaceuticals, Inc.'s ability to continue as a going concern as described in Note 1 to the combined financial statements). We have included our combined financial statements in the prospectus and elsewhere in the registration statement in reliance on Ernst & Young LLP's report, given on their authority as experts in accounting and auditing.

## WHERE YOU CAN FIND MORE INFORMATION

We have filed with the SEC a registration statement on Form S-1 under the Securities Act with respect to the shares of common stock offered hereby. This prospectus, which constitutes a part of the registration statement, does not contain all of the information set forth in the registration statement or the exhibits and schedules filed therewith. For further information about us and the common stock offered hereby, we refer you to the registration statement and the exhibits and schedules filed thereto. Statements contained in this prospectus regarding the contents of any contract or any other document that is filed as an exhibit to the registration statement are not necessarily complete, and each such statement is qualified in all respects by reference to the full text of such contract or other document filed as an exhibit to the registration statement. Upon the closing of this offering, we will be required to file periodic reports, proxy statements and other information with the SEC pursuant to the Exchange Act. The SEC maintains an Internet website that contains reports, proxy statements and other information about registrants, like us, that file electronically with the SEC. The address of that site is www.sec.gov.

Upon the closing of this offering, we will become subject to the information and periodic reporting requirements of the Exchange Act and, in accordance therewith, will file periodic reports, proxy statements and other information with the SEC. Such periodic reports, proxy statements and other information will be available at the website of the SEC referred to above. We maintain a website at www.phathompharma.com. Upon the closing of this offering, you may access our annual reports on Form 10-K, quarterly reports on Form 10-Q, current reports on Form 8-K, and amendments to those reports filed or furnished pursuant to Section 13(a) or 15(d) of the Exchange Act with the SEC free of charge at our website as soon as reasonably practicable after such material is electronically filed with, or furnished to, the SEC. The reference to our website address does not constitute incorporation by reference of the information contained on our website, and you should not consider the contents of our website in making an investment decision with respect to our common stock.

**PHATHOM PHARMACEUTICALS, INC.**

**INDEX TO COMBINED FINANCIAL STATEMENTS**

## REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Stockholders and the Board of Directors of
Phathom Pharmaceuticals, Inc.

***Opinion on the Financial Statements***

We have audited the accompanying combined balance sheet of Phathom Pharmaceuticals, Inc. (the Company) as of December 31, 2018, the related combined statement of operations, stockholders' deficit and cash flows for the year then ended, and the related notes (collectively referred to as the "combined financial statements"). In our opinion, the combined financial statements present fairly, in all material respects, the financial position of the Company at December 31, 2018, and the results of its operations and its cash flows for the year then ended in conformity with U.S. generally accepted accounting principles.

***The Company's Ability to Continue as a Going Concern***

The accompanying combined financial statements have been prepared assuming that the Company will continue as a going concern. As discussed in Note 1 to the financial statements, the Company has incurred net losses and negative cash flows from operating activities since its inception, and has stated that substantial doubt exists about the Company's ability to continue as a going concern. Management's evaluation of the events and conditions and management's plans regarding these matters are also described in Note 1. The combined financial statements do not include any adjustments that might result from the outcome of these uncertainties.

***Basis for Opinion***

These financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on the Company's financial statements based on our audit. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) (PCAOB) and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audit in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement, whether due to error or fraud. The Company is not required to have, nor were we engaged to perform, an audit of its internal control over financial reporting. As part of our audit we are required to obtain an understanding of internal control over financial reporting but not for the purpose of expressing an opinion on the effectiveness of the Company's internal control over financial reporting. Accordingly, we express no such opinion.

Our audit included performing procedures to assess the risks of material misstatement of the financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the financial statements. Our audit also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the financial statements. We believe that our audit provides a reasonable basis for our opinion.

/s/ Ernst & Young LLP

We have served as the Company's auditor since 2019.

San Diego, California
July 26, 2019
except for the last paragraph in Note 8, as to which the date is
October 15, 2019

**PHATHOM PHARMACEUTICALS, INC.**
**COMBINED BALANCE SHEETS**
**(in thousands, except share and par value data)**

| | December 31, 2018 | June 30, 2019 (unaudited) | Pro Forma June 30, 2019 (unaudited) |
|---|---|---|---|
| **Assets** | | | |
| Current assets: | | | |
| Cash and cash equivalents | $ 879 | $ 82,917 | |
| Prepaid expenses and other current assets (including related party amounts of $19 and $15, respectively) | 23 | 1,625 | |
| Total current assets | 902 | 84,542 | |
| Other assets | – | 337 | |
| Total assets | $ 902 | $ 84,879 | |
| **Liabilities and Stockholders' Deficit** | | | |
| Current liabilities: | | | |
| Accounts payable (including related party amounts of $45 and $31, respectively) | $ 55 | $ 450 | |
| Accrued expenses (including related party amounts of $2 and $19, respectively) | 170 | 995 | |
| Accrued interest (including related party amounts of $13 and $82, respectively) | 13 | 967 | $ 151 |
| Convertible promissory notes payable at fair value (including related party amounts of $1,950 and $20,552, respectively) | 1,950 | 92,743 | – |
| Warrant liabilities (including related party amounts of ($0 and $49,171, respectively) | – | 49,597 | 426 |
| Total current liabilities | 2,188 | 144,752 | |
| Long-term debt, net of discount | – | 22,449 | |
| Other long-term liabilities | – | 2,063 | |
| Total liabilities | 2,188 | 169,264 | |
| Commitments and contingencies (Note 3) | | | |
| Stockholders' deficit: | | | |
| Common stock, $0.0001 par value; authorized shares—50,000,000 at June 30, 2019 (unaudited); issued shares—11,876,518 at June 30, 2019 (unaudited); outstanding shares—7,219,268 at June 30, 2019 (unaudited); 17,983,458 and 13,326,208 shares issued and outstanding, respectively, pro forma (unaudited) | – | – | 1 |
| Additional paid-in capital | 2 | 5,916 | 148,645 |
| Accumulated deficit | (1,288) | (90,301) | (90,301) |
| Total stockholders' deficit | (1,286) | (84,385) | $ 58,345 |
| Total liabilities and stockholders' deficit | $ 902 | $ 84,879 | |

*See accompanying notes.*

**PHATHOM PHARMACEUTICALS, INC.**
**COMBINED STATEMENTS OF OPERATIONS**
**(in thousands, except share and per share data)**

| | Year Ended December 31, 2018 | Six Months Ended June 30, | |
|---|---|---|---|
| | | 2018 | 2019 |
| | | (unaudited) | |
| Operating expenses: | | | |
| Research and development | $ 20 | $ – | $ 3,201 |
| In-process research and development | – | – | 78,897 |
| General and administrative (includes related party amounts of $321, $124 and $18, respectively) | 1,205 | 506 | 2,142 |
| Total operating expenses | 1,225 | 506 | 84,240 |
| Loss from operations | (1,225) | (506) | (84,240) |
| Other income (expense): | | | |
| Interest income | – | – | 101 |
| Interest expense (includes related party amounts of $(13), $(4) and $(82), respectively) | (13) | (4) | (1,148) |
| Change in fair value of warrant liabilities (includes related party amounts of $0, $0 and $(1,277), respectively) | – | – | (1,284) |
| Change in fair value of convertible promissory notes (includes related party amounts of $(50), $(4) and $(502), respectively) | (50) | (4) | (2,442) |
| Total other income (expense) | (63) | (8) | (4,773) |
| Net loss | $ (1,288) | $ (514) | $ (89,013) |
| Net loss per share, basic and diluted | $ (0.21) | $ (0.10) | $ (13.40) |
| Weighted-average shares of common stock outstanding, basic and diluted | 6,051,675 | 5,331,270 | 6,640,394 |
| Pro forma net loss per share, basic and diluted (unaudited) | $ (0.20) | | $ (9.85) |
| Pro forma weighted-average shares of common stock outstanding, basic and diluted (unaudited) | 6,098,429 | | 8,578,296 |

*See accompanying notes.*

**PHATHOM PHARMACEUTICALS, INC.**
**COMBINED STATEMENTS OF STOCKHOLDERS' DEFICIT**
**(in thousands, except share data)**

| | Common Stock | | Additional Paid-in Capital | Accumulated Deficit | Total Stockholders' Deficit |
|---|---|---|---|---|---|
| | Shares | Amount | | | |
| Combined balance at January 1, 2018 | – | $ – | $ – | $ – | $ – |
| Issuance of common stock to founders | – | – | 2 | – | 2 |
| Net loss | – | – | – | (1,288) | (1,288) |
| Combined balance at December 31, 2018 | – | – | 2 | (1,288) | (1,286) |
| Merger of entities under common control into the Company (unaudited) | 6,760,334 | – | – | – | – |
| Vesting restrictions placed on previously issued and outstanding common stock (unaudited) | (3,373,408) | – | – | – | – |
| Issuance of common stock (unaudited) | 1,491,072 | – | – | – | – |
| Issuance of common stock in connection with license agreement (unaudited) | 1,084,000 | – | 5,885 | – | 5,885 |
| Vesting of restricted shares (unaudited) | 1,257,270 | – | – | – | – |
| Stock-based compensation (unaudited) | – | – | 29 | – | 29 |
| Net loss (unaudited) | – | – | – | (89,013) | (89,013) |
| Balance at June 30, 2019 (unaudited) | 7,219,268 | $ – | $ 5,916 | $ (90,301) | $ (84,385) |

| | Common Stock | | Additional Paid-in Capital | Accumulated Deficit | Total Stockholders' Deficit |
|---|---|---|---|---|---|
| | Shares | Amount | | | |
| Combined balance at January 1, 2018 | – | $ – | $ – | $ – | $ – |
| Issuance of common stock to founders (unaudited) | – | – | 2 | – | 2 |
| Net loss (unaudited) | – | – | – | (514) | (514) |
| Combined balance at June 30, 2018 (unaudited) | – | $ – | $ 2 | $ (514) | $ (512) |

*See accompanying notes.*

**PHATHOM PHARMACEUTICALS, INC.**
**COMBINED STATEMENTS OF CASH FLOWS**
**(in thousands)**

| | Year Ended December 31, 2018 | Six Months Ended June 30, 2018 | Six Months Ended June 30, 2019 |
|---|---|---|---|
| | | (unaudited) | |
| **Cash flows from operating activities** | | | |
| Net loss | $ (1,288) | $ (514) | $ (89,013) |
| Adjustments to reconcile net loss to net cash used in operating activities: | | | |
| Stock-based compensation | – | – | 29 |
| Amortization of debt discount | – | – | 81 |
| Acquired in-process research and development | – | – | 78,897 |
| Change in fair value of warrant liabilities (includes related party amounts of $0, $0 and $1,277, respectively) | – | – | 1,284 |
| Change in fair value of convertible promissory notes (includes related party amounts of $50, $4 and $502, respectively) | 50 | 4 | 2,442 |
| Changes in operating assets and liabilities: | | | |
| Prepaid expenses and other current assets (includes related party amounts of $(19), $(13) and $4, respectively) | (23) | (18) | (1,602) |
| Accounts payable and accrued expenses (includes related party amounts of $47, $54 and $3, respectively) | 225 | 72 | 883 |
| Accrued interest (includes related party amounts of $13, $4 and $82, respectively) | 13 | 4 | 981 |
| Net cash used in operating activities | (1,023) | (452) | (6,018) |
| **Cash flows from investing activities** | | | |
| Cash paid for purchased in-process research and development | – | – | (25,118) |
| Net cash used in investing activities | – | – | (25,118) |
| **Cash flows from financing activities** | | | |
| Proceeds from issuance of common stock | 2 | 2 | – |
| Proceeds from issuance of convertible promissory notes | 1,900 | 550 | 88,324 |
| Proceeds from issuance of long-term debt | – | – | 24,850 |
| Net cash provided by financing activities | 1,902 | 552 | 113,174 |
| Net increase in cash | 879 | 100 | 82,038 |
| Cash and cash equivalents—beginning of period | – | – | 879 |
| Cash and cash equivalents—end of period | $ 879 | $ 100 | $ 82,917 |
| **Supplemental disclosure of cash flow information** | | | |
| Interest paid | $ – | $ – | $ 86 |
| **Supplemental disclosure of noncash investing and financing activities** | | | |
| Exchange of accrued interest for convertible promissory notes | $ – | $ – | $ 27 |
| Issuance of Takeda Warrants in connection with Takeda License | $ – | $ – | $ 47,894 |
| Issuance of common stock in connection with Takeda License | $ – | $ – | $ 5,885 |
| Issuance of common stock warrants in connection with long-term debt | $ – | $ – | $ 419 |
| Unpaid initial public offering costs | $ – | $ – | $ 337 |
| Final interest payment fee | $ – | $ – | $ 2,063 |

*See accompanying notes.*

**PHATHOM PHARMACEUTICALS, INC.**
**NOTES TO COMBINED FINANCIAL STATEMENTS**
**(Information as of June 30, 2019 and thereafter and for the six months ended June 30, 2018 and 2019 is unaudited)**

## 1. Organization, Basis of Presentation and Summary of Significant Accounting Policies

### *Organization*

Phathom Pharmaceuticals, Inc. (the "Company" or "Phathom") was incorporated in the state of Delaware in January 2018 under the name North Bridge IV, Inc. On March 13, 2019, the Company changed its name to Phathom Pharmaceuticals, Inc. and merged with YamadaCo IIA, Inc. ("YamadaCo"), a Delaware corporation formed in September 2017, with Phathom being the surviving entity (the "Merger"). All activities of YamadaCo prior to 2018 related to formation and were insignificant. The Company is a late clinical-stage biopharmaceutical company focused on developing and commercializing novel treatments for gastrointestinal diseases.

### *Stock Split and Conversion*

During 2018, without consideration of the forward stock split described in Note 8, both the Company and YamadaCo issued 1,000 shares of common stock at a purchase price of $1.00 per share, and had no other capital transactions prior to the Merger. Immediately prior to the Merger, the Company effected a 1,559.1183-for-1 forward stock split for each outstanding share of its common stock and, effective upon the closing of the Merger, each issued and outstanding share of YamadaCo was converted into 1,559.1183 shares of the Company's common stock. Upon completion of the Merger, the Company had 6,760,334 shares of common stock outstanding, with the prior stockholders of each YamadaCo and Phathom holding an equal number of shares. The accompanying combined financial statements and notes to the combined financial statements give retroactive effect to the forward stock split and conversion for all periods presented.

### *Basis of Presentation*

The Company's combined financial statements are prepared in accordance with U.S. generally accepted accounting principles ("GAAP"). The accompanying combined financial statements include the accounts of the Company (the receiving entity) and YamadaCo, prior to the Merger. The Company and YamadaCo were entities under the common control of Frazier Life Sciences IX, L.P. ("Frazier") as a result of, among others, Frazier's; (i) ownership of a majority of the outstanding capital stock of both companies, (ii) financing of both companies, (iii) control of board of directors of both companies, and (iv) management of both companies. Both the Company and YamadaCo were formed for the purpose of identifying potential assets around which to form an operating company. As the merged entities were under common control, the combined financial statements report the financial position, results of operations and cash flows of the Company and YamadaCo as though the transfer of net assets and equity interests had occurred at the beginning of 2018. All intercompany accounts and transactions have been eliminated in combination.

### *Liquidity and Capital Resources*

From inception to June 30, 2019, the Company has devoted substantially all of its efforts to organizing and staffing the Company, business planning, raising capital, in-licensing its initial product candidate, vonoprazan, meeting with regulatory authorities, and preparing for the planned Phase 3 clinical trials of vonoprazan. The Company has a limited operating history, has never generated any revenue, and the sales and income potential of its business is unproven. The Company has incurred net losses and negative cash flows from operating activities since its inception and expects to continue to incur net losses into the foreseeable future as it continues the development and commercialization

**PHATHOM PHARMACEUTICALS, INC.**
**NOTES TO COMBINED FINANCIAL STATEMENTS—(CONTINUED)**
**(Information as of June 30, 2019 and thereafter and for the six months ended June 30, 2018 and 2019 is unaudited)**

of vonoprazan. From inception to June 30, 2019, the Company has funded its operations through the issuance of convertible promissory notes and commercial bank debt.

The accompanying combined financial statements have been prepared assuming the Company will continue as a going concern, which contemplates the realization of assets and the satisfaction of liabilities in the normal course of business, and do not include any adjustments to reflect the possible future effects on the recoverability and classification of assets or amounts and classification of liabilities that may result from the outcome of this uncertainty. Management is required to perform a two-step analysis over the Company's ability to continue as a going concern. Management must first evaluate whether there are conditions and events that raise substantial doubt about the Company's ability to continue as a going concern (Step 1). If management concludes that substantial doubt is raised, management is also required to consider whether its plans alleviate that doubt (Step 2). Management has prepared cash flow forecasts which indicate that based on the Company's expected operating losses, negative cash flows and maturities of outstanding convertible promissory notes, there is substantial doubt about the Company's ability to continue as a going concern for twelve months after the date the combined financial statements for the year ended December 31, 2018 and the six months ended June 30, 2019 are issued.

The Company's ability to continue as a going concern is dependent upon its ability to raise additional funding. Management plans to raise additional capital through equity offerings, the Company's existing loan and security agreement, debt financings, or other capital sources, including potential collaborations, licenses and other similar arrangements. While management believes this plan to raise additional funds will alleviate the conditions that raise substantial doubt, these plans are not entirely within its control and cannot be assessed as being probable of occurring. The Company may not be able to secure additional financing in a timely manner or on favorable terms, if at all. Furthermore, if the Company issues equity securities to raise additional funds, its existing stockholders may experience dilution, and the new equity securities may have rights, preferences and privileges senior to those of the Company's existing stockholders. If the Company raises additional funds through collaboration, licensing or other similar arrangements, it may be necessary to relinquish valuable rights to its potential products on terms that are not favorable to the Company. If the Company is unable to raise capital when needed or on attractive terms, it would be forced to delay, reduce or eliminate its research and development programs or other operations. If any of these events occur, the Company's ability to achieve the development and commercialization goals would be adversely affected.

***Use of Estimates***

The preparation of the Company's combined financial statements requires it to make estimates and assumptions that impact the reported amounts of assets, liabilities and expenses and the disclosure of contingent assets and liabilities in the Company's combined financial statements and accompanying notes. The most significant estimates in the Company's combined financial statements relate to accruals for research and development expenses, and the valuation of convertible promissory notes, warrant liabilities and various other equity instruments. Although these estimates are based on the Company's knowledge of current events and actions it may undertake in the future, actual results could differ materially from those estimates and assumptions.

***Unaudited Interim Financial Information***

The accompanying interim balance sheet as of June 30, 2019, the combined statements of operations and cash flows for the six months ended June 30, 2018 and 2019 and the combined

**PHATHOM PHARMACEUTICALS, INC.**
**NOTES TO COMBINED FINANCIAL STATEMENTS—(CONTINUED)**
**(Information as of June 30, 2019 and thereafter and for the six months ended June 30, 2018 and 2019 is unaudited)**

statement of stockholders' deficit for the six months ended June 30, 2018 and 2019 and the related footnote disclosures are unaudited. In management's opinion, the unaudited interim financial statements have been prepared on the same basis as the audited combined financial statements and include all adjustments, which include only normal recurring adjustments, necessary for the fair presentation of the Company's financial position as of June 30, 2019 and its results of operations and cash flows for the six months ended June 30, 2018 and 2019 in accordance with GAAP. The results for the six months ended June 30, 2019 are not necessarily indicative of the results expected for the full fiscal year or any other interim period.

***Unaudited Pro Forma Balance Sheet Information***

The unaudited pro forma balance sheet information as of June 30, 2019 in the accompanying combined balance sheet gives effect to: (i) the automatic conversion of all outstanding convertible promissory notes and related accrued interest (see Note 4) into 6,106,940 shares of common stock (assuming an initial public offering ("IPO") price of $19.00 per share, which is the midpoint of the price range set forth on the cover page of this prospectus and assuming the conversion occurs on October 28, 2019), the expected closing date of the Company's IPO, and (ii) the reclassification of the Takeda Warrant to stockholders' equity. Shares of common stock issued in the IPO and any related net proceeds are excluded from the pro forma information.

***Fair Value Option***

As permitted under Accounting Standards Codification ("ASC") 825, *Financial Instruments*, ("ASC 825"), the Company has elected the fair value option to account for its convertible promissory notes issued since inception. In accordance with ASC 825, the Company records these convertible promissory notes at fair value with changes in fair value recorded in the combined statements of operations. As a result of applying the fair value option, direct costs and fees related to the convertible promissory notes were recognized in earnings as incurred and not deferred.

***Fair Value Measurements***

The accounting guidance defines fair value, establishes a consistent framework for measuring fair value and expands disclosure for each major asset and liability category measured at fair value on either a recurring or non-recurring basis. Fair value is defined as an exit price, representing the amount that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants. As such, fair value is a market-based measurement that should be determined based on assumptions that market participants would use in pricing an asset or liability. As a basis for considering such assumptions, the accounting guidance establishes a three-tier fair value hierarchy, which prioritizes the inputs used in measuring fair value as follows:

| | |
|---|---|
| Level 1: | Observable inputs such as quoted prices in active markets. |
| Level 2: | Inputs, other than the quoted prices in active markets that are observable either directly or indirectly. |
| Level 3: | Unobservable inputs in which there is little or no market data, which require the reporting entity to develop its own assumptions. |

The carrying amounts of the Company's financial instruments, including cash and cash equivalents classified within the Level 1 designation discussed above, prepaid and other current

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assets, accounts payable, and accrued liabilities, approximate fair value due to their short maturities. Warrant liabilities and convertible promissory notes are recorded at fair value on a recurring basis.

The Company has no financial assets measured at fair value on a recurring basis. None of the Company's non-financial assets or liabilities are recorded at fair value on a non-recurring basis. No transfers between levels have occurred during the periods presented.

Liabilities measured at fair value on a recurring basis are as follows (in thousands):

| | | Fair Value Measurements at Reporting Date Using: | | |
|---|---|---|---|---|
| | Total | Quoted Prices in Active Markets for Identical Assets (Level 1) | Significant Other Observable Inputs (Level 2) | Significant Unobservable Inputs (Level 3) |
| As of December 31, 2018: | | | | |
| Convertible promissory notes | $ 1,950 | $ – | $ – | $ 1,950 |
| As of June 30, 2019: | | | | |
| Warrant liabilities | $ 49,597 | $ – | $ – | $ 49,597 |
| Convertible promissory notes | 92,743 | – | – | 92,743 |
| Total | $ 142,340 | $ – | $ – | $ 142,340 |

The warrant liabilities consist of an issued and outstanding common stock warrant (the "Takeda Warrant") and a right to receive an additional common stock warrant (the "Takeda Warrant Right", and together with the Takeda Warrant, the "Takeda Warrants") issued to Takeda Pharmaceutical Company Limited ("Takeda") in connection with a May 2019 license agreement (see Note 3) and warrants (the "Lender Warrants") issued in connection with a loan and security agreement for commercial bank debt (see Note 5). The Takeda Warrants are accounted for as liabilities as they do not meet all the conditions for equity classification due to (i) insufficient authorized shares for the Takeda Warrant and (ii) the Takeda Warrant Right is not indexed to the Company's own stock. The Lender Warrants are accounted for as liabilities as they contain a holder put right under which the lenders could require the Company to pay cash in exchange for the warrants. The fair value of the Takeda Warrants is derived from the model used to estimate the fair value the Company's common stock (see Note 6). The fair value of the Lender Warrants is estimated using a probability-weighted model considering IPO and non-IPO scenarios. The IPO scenarios utilize a binomial lattice model to estimate a distribution of total equity values as of a projected IPO date. The non-IPO scenario utilizes the repurchase price associated with the warrant put right discounted to present value based on venture capital rates of return and the term associated with the put right. As of June 30, 2019, the fair value of the Takeda Warrants was $49.2 million and the fair value of the Lender Warrants was $0.4 million.

As further described in Note 4, the Company issued convertible promissory notes to Frazier (the "Frazier Notes") from January 2018 to April 2019 and issued convertible promissory notes in May 2019 (the "May 2019 Notes") to investors including Frazier. The Company has elected the fair value option for each of its convertible promissory note issuances. The fair value of the Frazier Notes was estimated using a scenario-based analysis that estimated the fair value of the convertible promissory notes based on the probability-weighted present value of expected future investment returns, considering possible

outcomes available to the noteholders, including conversions in subsequent equity financings, change of control transactions, settlement and dissolution. The fair value of the May 2019 Notes is estimated using a scenario-based analysis that estimates the fair value of the convertible promissory notes based on the probability-weighted present value of expected future investment returns, considering each of the possible outcomes available to the noteholders, including various IPO, settlement, equity financing, corporate transaction and dissolution scenarios. As of December 31, 2018, the fair value of the Frazier Notes was $2.0 million and the Frazier Notes were exchanged for May 2019 Notes in May 2019. As of June 30, 2019, the fair value of the May 2019 Notes was $92.7 million.

The Company adjusts the carrying value of its warrant liabilities and convertible promissory notes to their estimated fair value at each reporting date, with any related increases or decreases in the fair value recorded as change in fair value of warrant liabilities and change in fair value of convertible promissory notes, respectively, in the combined statements of operations.

The following table summarizes information about the significant unobservable inputs used in the fair value measurements for the Takeda Warrants and the May 2019 Notes:

| Liability | Fair value as of initial valuation date (in thousands) | Fair value as of June 30, 2019 (in thousands) | Fair value method as of initial valuation date (and relative weighting) | Fair value method as of June 30, 2019 (and relative weighting) | Key unobservable inputs | Range |
|---|---|---|---|---|---|---|
| Takeda Warrants | $ 47,894 | $ 49,171 | Financing transactions (40%)<br>Income approach (60%) | Financing transactions (40%)<br>Income approach (60%) | Transaction prices per share<br>Estimated time to liquidity<br>Discount rate | $9.33-$10.56<br>0.29-1.73 years<br>13% |
| May 2019 Notes | $ 90,250 | $ 92,743 | Financing transactions (40%)<br>Income approach (60%) | Financing transactions (40%)<br>Income approach (60%) | Estimated time to liquidity<br>Volatility<br>Discount rate | 0.29-1.73 years<br>70%<br>22.6%-25% |

There are significant judgments, assumptions and estimates inherent in the determination of the fair value of each of the instruments described above. These include determination of a valuation method and selection of the possible outcomes available to the Company, including the determination of timing and expected future investment returns for such scenarios. The Company considered the equity value of an initial public offering using market transactions and have determined the expected value of various stay private and dissolution scenarios using the income approach, which is based on assumptions regarding the Company's future operating performance. The related judgments, assumptions and estimates are highly interrelated and changes in any one assumption could necessitate changes in another. In particular, any changes in the probability of a particular outcome would require a related change to the probability of another outcome. In addition, the fair value of the May 2019 Notes is derived using assumptions that are consistent with the assumptions used to value the Company's common stock and the Takeda Warrants, and the concluded fair value of the May 2019 Notes is used in the determination of both the fair value of the Company's common stock and the Takeda Warrants. In the future, depending on the valuation approaches used and the expected timing and weighting of each, the inputs described above, or other inputs, may have a greater or lesser impact on the Company's estimates of fair value.

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The following table provides a reconciliation of all liabilities measured at fair value using Level 3 significant unobservable inputs (in thousands):

| | Warrant Liabilities | Convertible Promissory Notes |
|---|---|---|
| Balance at January 1, 2018 | $ – | $ – |
| Issuance of convertible promissory notes | – | 1,900 |
| Change in fair value | – | 50 |
| Balance at December 31, 2018 | – | 1,950 |
| Issuance of convertible promissory notes | – | 90,750 |
| Exchange of convertible promissory notes (Note 4) | – | (2,399) |
| Issuance of warrants | 48,313 | – |
| Change in fair value | 1,284 | 2,442 |
| Balance at June 30, 2019 | $49,597 | $ 92,743 |

***Cash and Cash Equivalents***

The Company considers all highly liquid investments with original maturities of three months or less when purchased to be cash equivalents. Cash and cash equivalents include cash in readily available checking accounts and money market funds.

***Concentrations of Credit Risk***

Financial instruments that potentially subject the Company to significant concentrations of credit risk consist primarily of cash and cash equivalents. The Company maintains deposits in federally insured financial institutions in excess of federally insured limits. The Company has not experienced any losses in such accounts and management believes that the Company is not exposed to significant credit risk due to the financial position of the depository institutions in which those deposits are held.

***Deferred Offering Costs***

The Company has deferred offering costs consisting of legal, accounting and other fees and costs directly attributable to its planned IPO. The deferred offering costs will be offset against the proceeds received upon the completion of the planned IPO. In the event the planned IPO is terminated, all of the deferred offering costs will be expensed within the Company's statements of operations. As of June 30, 2019, $0.3 million of deferred offering costs were recorded within other long-term assets on the balance sheet. No such costs were included on the combined balance sheet as of December 31, 2018.

***Research and Development Expenses and Accruals***

All research and development costs are expensed in the period incurred and consist primarily of salaries, payroll taxes, employee benefits, stock-based compensation charges for those individuals involved in research and development efforts, external research and development costs incurred under agreements with contract research organizations and consultants to conduct and support the Company's planned clinical trials of vonoprazan, and costs related to manufacturing vonoprazan for clinical trials.

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The Company has entered into various research and development contracts with clinical research organizations, clinical manufacturing organizations and other companies. Payments for these activities are based on the terms of the individual agreements, which may differ from the pattern of costs incurred, and payments made in advance of performance are reflected in the accompanying balance sheets as prepaid expenses or accrued liabilities. The Company records accruals for estimated costs incurred for ongoing research and development activities. When evaluating the adequacy of the accrued liabilities, the Company analyzes progress of the services, including the phase or completion of events, invoices received and contracted costs. Significant judgments and estimates may be made in determining the prepaid or accrued balances at the end of any reporting period. Actual results could differ from the Company's estimates.

***In-Process Research and Development***

The Company evaluates whether acquired intangible assets are a business under applicable accounting standards. Additionally, the Company evaluates whether the acquired assets have a future alternative use. Intangible assets that do not have future alternative use are considered acquired in-process research and development. When the acquired in-process research and development assets are not part of a business combination, the value of the consideration paid is expensed on the acquisition date. Future costs to develop these assets are recorded to research and development expense as they are incurred.

***Stock-Based Compensation***

Stock-based compensation expense represents the cost of the grant date fair value of equity awards recognized over the requisite service period of the awards (generally the vesting period) on a straight-line basis. The Company recognizes forfeitures as they occur.

***Income Taxes***

The Company accounts for income taxes under the asset and liability method, which requires the recognition of deferred tax assets and liabilities for the expected future tax consequences of events that have been included in the financial statements. Under this method, deferred tax assets and liabilities are determined on the basis of the differences between the financial statements and tax basis of assets and liabilities using enacted tax rates in effect for the year in which the differences are expected to reverse. The effect of a change in tax rates on deferred tax assets and liabilities is recognized in the statement of operations in the period that includes the enactment date.

The Company recognizes net deferred tax assets to the extent that the Company believes these assets are more likely than not to be realized. In making such a determination, management considers all available positive and negative evidence, including future reversals of existing taxable temporary differences, projected future taxable income, tax-planning strategies, and results of recent operations. If management determines that the Company would be able to realize its deferred tax assets in the future in excess of their net recorded amount, management would make an adjustment to the deferred tax asset valuation allowance, which would reduce the provision for income taxes.

The Company records uncertain tax positions on the basis of a two-step process whereby (i) management determines whether it is more likely than not that the tax positions will be sustained on

the basis of the technical merits of the position and (ii) for those tax positions that meet the more-likely-than-not recognition threshold, management recognizes the largest amount of tax benefit that is more than 50 percent likely to be realized upon ultimate settlement with the related tax authority. The Company recognizes interest and penalties related to unrecognized tax benefits within income tax expense. Any accrued interest and penalties are included within the related tax liability.

***Comprehensive Loss***

Comprehensive loss is defined as a change in equity during a period from transactions and other events and circumstances from non-owner sources. The Company's comprehensive loss was the same as its reported net loss for all periods presented.

***Segment Reporting***

Operating segments are identified as components of an enterprise about which separate discrete financial information is available for evaluation by the chief operating decision maker in making decisions on how to allocate resources and assess performance. The Company views its operations and manages its business as one operating segment.

***Net Loss Per Share***

For the year ended December 31, 2018 and the six months ended June 30, 2018 and 2019, the net loss per share was recast to include in the numerator the net losses of both the Company and YamadaCo and include in the denominator the combined weighted-average outstanding shares of both the Company and YamadaCo. Basic net loss per share is computed by dividing the combined net loss by the weighted-average number of common shares outstanding for the period, without consideration for potentially dilutive securities. The Company has excluded weighted-average unvested shares of 2,728,593 shares from the weighted-average number of common shares outstanding for the six months ended June 30, 2019. No shares of common stock were unvested during the year ended December 31, 2018. Diluted net loss per share is computed by dividing the combined net loss by the weighted-average number of common shares and dilutive common stock equivalents outstanding for the period determined using the treasury-stock and if-converted methods. Dilutive common stock equivalents are comprised of unvested common stock, warrants and convertible promissory notes. For all periods presented, there is no difference in the number of shares used to calculate basic and diluted shares outstanding as inclusion of the potentially dilutive securities would be antidilutive.

***Unaudited Pro Forma Net Loss Per Share***

The unaudited pro forma basic and diluted net loss per share reflects (i) the automatic conversion of all outstanding convertible promissory notes and related accrued interest into 6,106,940 shares of common stock (assuming an IPO price of $19.00 per share, which is the midpoint of the price range set forth on the cover page of this prospectus and assuming the conversion occurs on October 28, 2019, the expected closing date of the Company's IPO), and (ii) the reclassification of the Takeda Warrant to stockholders' equity, each as of the beginning of the period presented or the issuance date, if later.

The unaudited pro forma basic and diluted net loss per share amounts do not give effect to the issuance of common stock issued in the IPO nor do they give effect to potential dilutive securities where the impact would be anti-dilutive.

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The following table summarizes the Company's unaudited pro forma net loss per share (in thousands, except share and per share data):

| | Year Ended December 31, 2018 | Six Months Ended June 30, 2019 |
|---|---|---|
| **Numerator** | | |
| Net loss | $ (1,288) | $ (89,013) |
| Interest expense on convertible promissory notes | 13 | 831 |
| Change in fair value of Takeda Warrant | – | 1,277 |
| Change in fair value of convertible promissory notes | 50 | 2,442 |
| Pro forma net loss | $ (1,225) | $ (84,463) |
| **Denominator** | | |
| Weighted-average shares of common stock outstanding, basic and diluted | 6,051,675 | 6,640,394 |
| Pro forma adjustments to reflect assumed weighted-average effect of conversion of convertible promissory notes | 46,754 | 1,937,902 |
| Pro forma weighted-average shares of common stock outstanding, basic and diluted | 6,098,429 | 8,578,296 |
| Pro forma net loss per share, basic and diluted | $ (0.20) | $ (9.85) |

***Recently Adopted Accounting Pronouncements***

In June 2018, the Financial Accounting Standards Board ("FASB") issued Accounting Standards Update ("ASU") No. 2018-07, *Compensation—Stock Compensation (Topic 718): Improvements to Nonemployee Share-Based Payment Accounting*. This guidance expands the scope of Topic 718, *Compensation—Stock Compensation*, which currently only includes share-based payments to employees, to include share-based payments issued to nonemployees for goods or services. Consequently, the accounting for share-based payments to nonemployees and employees will be substantially aligned. This ASU supersedes Subtopic 505-50, *Equity—Equity-Based Payments to Non-Employees* and is effective for public companies for annual periods beginning after December 15, 2018, including interim periods within those fiscal years, with early adoption permitted as long as ASU No. 2014-09 has been adopted by the Company. The Company adopted this guidance effective January 1, 2018, and the adoption did not have a material impact on the Company's financial statements.

In February 2016, the FASB issued ASU No. 2016-02, *Leases (Topic 842)*, which requires a lessee to recognize a lease liability and a right-of-use asset for all leases with lease terms of more than 12 months. Additionally, certain qualitative and quantitative disclosures will be required in the financial statements. This guidance is effective for annual reporting periods beginning after December 15, 2018, including interim periods within those fiscal years, and early adoption is permitted. Companies may adopt this guidance using a modified retrospective approach for leases that exist or are entered into after the beginning of the earliest comparative period in the financial statements. The Company adopted this guidance effective January 1, 2018, and the adoption did not have any impact on the Company's financial statements as the Company did not have any leases through June 30, 2019. As

the Company enters into future, material lease agreements, the adoption of this guidance is expected to result in a significant increase in the total assets and liabilities reported on the balance sheets.

***Recently Issued Accounting Pronouncements***

In August 2018, the FASB issued ASU No. 2018-13, *Fair Value Measurement (Topic 820): Disclosure Framework—Changes to the Disclosure Requirements for Fair Value Measurement,* which eliminates, modifies and adds disclosure requirements on fair value measurements. The standard is effective for annual periods beginning after December 15, 2019, including interim periods within those fiscal years, and early adoption is permitted. The Company is currently evaluating the impact the adoption of ASU No. 2018-13 will have on the Company's financial statements.

**2. Related Party Transactions**

Frazier is a principal stockholder of the Company and is represented on the Company's board of directors. For the year ended December 31, 2018 and the six months ended June 30, 2019, the Company conducted its operations within office space controlled by Frazier and Frazier allocated a portion of the costs associated with this office to the Company. In addition, Frazier paid for various goods and services, such as employee wages, insurance and expense reimbursements and various administrative services associated with the operations of the Company and charged the Company for those expenses. As of December 31, 2018 and June 30, 2019, the Company had outstanding accounts payable balances due to Frazier of $45,000 and $50,000, respectively, related to these shared operating expenses. For the year ended December 31, 2018 and the six months ended June 30, 2018 and 2019, the Company incurred $0.3 million, $0.1 million and $0.1 million, respectively, of shared operating expenses. In addition to the shared operating expenses, the Company issued convertible promissory notes to Frazier during 2018 and 2019 (see Note 4).

Mountain Field LLC ("Mountain Field") is an entity owned by the chairman of the Company's board of directors. During the year ended December 31, 2018 and the six months ended June 30, 2019, the Company charged Mountain Field for certain rent and payroll related expenses. These shared expenses were allocated based on usage of the related facilities and time incurred by personnel. As of December 31, 2018 and June 30, 2019, the Company had an outstanding accounts receivable balance from Mountain Field of $19,000 and $15,000, respectively, related to shared operating expenses. For the year ended December 31, 2018 and the six months ended June 30, 2018 and 2019, the Company charged Mountain Field $4,000, $3,000 and $0.1 million, respectively, for shared expenses.

Takeda became a common stockholder of the Company as of May 7, 2019 in connection with the May 2019 license agreement (see Note 3).

**3. Commitments and Contingencies**

***License Agreement***

On May 7, 2019, the Company entered into a license agreement with Takeda pursuant to which it was granted an exclusive license to commercialize vonoprazan fumarate in the United States, Canada and Europe (the "Takeda License"). The Company also has the right to sublicense its rights under the

agreement, subject to certain conditions. The agreement will remain in effect, on a country-by-country and product-by-product basis, until the later of (i) the expiration of the last to expire valid patent claim covering vonoprazan fumarate alone or in combination with at least one other therapeutically active ingredient, (ii) the expiration of the applicable regulatory exclusivity and (iii) 15 years from the date of first commercial sale, unless earlier terminated. The Company may terminate the Takeda License upon six months' written notice. The Company and Takeda may terminate the Takeda License in the case of the other party's insolvency or material uncured breach. Takeda may terminate the Takeda License if the Company challenges, or assists in challenging, licensed patents.

In consideration of the Takeda License, the Company (i) paid Takeda $25.0 million in cash, (ii) issued Takeda 1,084,000 shares of its common stock at a fair value of $5.9 million, (iii) issued the Takeda Warrant to purchase 7,588,000 shares of its common stock at an exercise price of $0.00004613 per share at an initial fair value of $47.9 million, and (iv) issued the Takeda Warrant Right to receive an additional common stock warrant should Takeda's fully-diluted ownership of the Company represent less than a certain specified percentage of the fully-diluted capitalization, including shares issuable upon conversion of outstanding convertible promissory notes, calculated immediately before the closing of the Company's IPO, with a nominal initial fair value due to the low probability of issuance. In addition, the Company is obligated to pay Takeda up to an aggregate of $250.0 million in sales milestones upon the achievement of specified levels of product sales, and a low double-digit royalty rate on aggregate net sales of licensed products, subject to certain adjustments. The Company incurred $0.1 million of transaction costs in connection with the Takeda License. The Takeda Warrant has an exercise price of $0.00004613 per share, expires on May 7, 2029 and becomes exercisable upon (i) certain change of control transactions of the Company or (ii) the consummation of an IPO by the Company.

The transaction has been accounted for as an asset acquisition as substantially all of the fair value is concentrated in a group of similar assets. The $78.9 million fair value of the consideration paid for these research and development assets, which have no alternative future use, was recorded as in-process research and development in the Company's combined statement of operations for the six months ended June 30, 2019.

***Contingencies***

In the event the Company becomes subject to claims or suits arising in the ordinary course of business, the Company would accrue a liability for such matters when it is probable that future expenditures will be made and such expenditures can be reasonably estimated.

**4. Convertible Promissory Notes**

***Frazier Convertible Note Financing***

From January 2018 to April 2019, the Company issued the Frazier Notes for an aggregate of $2.4 million and bearing interest at per annum rates ranging from 1.68% to 2.55%. Of the Frazier Notes, $1.9 million were issued in 2018 and $0.5 million were issued in April 2019. Due to certain embedded features within the Frazier Notes, the Company elected to account for these notes and all their embedded features under the fair value option. The Company recorded changes in the fair value of the Frazier Notes in the combined statements of operations until May 2019, when the Frazier Notes and related accrued interest were exchanged, at their then fair value of $2.4 million, for the May 2019

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Notes. For the year ended December 31, 2018 and the six months ended June 30, 2018, the Company recognized $50,000 and $4,000, respectively, of change in fair value of convertible promissory notes in the combined statements of operations related to increases in the fair value of the Frazier Notes. For the six months ended June 30, 2019, the Company recognized $50,000 of other income in the combined statements of operations related to decreases in the fair value of the Frazier Notes. For the year ended December 31, 2018 and the six months ended June 30, 2018 and 2019, the Company recognized $13,000, $4,000 and $15,000, respectively, of interest expense in connection with the Frazier Notes.

***May 2019 Convertible Note Financing***

On May 7, 2019, the Company entered into a note purchase agreement under which it issued the unsecured May 2019 Notes for an aggregate of $90.3 million, resulting in gross proceeds to the Company of $87.8 million in cash and $2.4 million related to the exchange of the Frazier Notes and related accrued interest for the May 2019 Notes. Including the conversion of the Frazier Notes, Frazier purchased $20.0 million of the May 2019 Notes. The May 2019 Notes bear interest at a rate of 6% per annum and are subordinated to borrowings under the Company's loan and security agreement (see Note 5). The May 2019 Notes become payable upon demand of the holders of at least 60% of the outstanding principal amount of the May 2019 Notes, including Frazier, on May 7, 2020 (the "Maturity Date"), and become due and payable on May 7, 2022, subject to earlier conversion or repayment in the event the Company completes certain equity financings or a change of control. The May 2019 Notes can be converted/redeemed as follows (i) automatically converted upon a qualified equity financing, with a conversion price of the lesser of 80% of the price paid per share in such financing or the conversion cap price per share, (ii) optionally converted upon a non-qualified equity financing with a conversion price of 80% of the price paid per share in such financing, (iii) optionally converted any time after the Maturity Date, with a conversion price per share of the conversion cap price per share, (iv) automatically upon an IPO with a conversion price per share of the lesser of 80% of the IPO price per share, or the conversion cap price per share, and (v) upon certain corporate transactions, receive cash equal to the greater of (A) two times the then outstanding principal and accrued interest and (B) an amount equal to the amount that would be received as if the May 2019 Notes were converted with a conversion price of the conversion cap price per share. The conversion cap price per share is defined as $500.0 million less the outstanding principal and accrued interest divided by the total of (1) the total number of common shares outstanding immediately prior to conversion, (2) the number of common shares issuable upon exercise or conversion of exercisable or convertible securities, and (3) the number of shares of capital stock reserved for issuance under the Company's equity incentive plan.

The note purchase agreement includes, among others, covenants related to delivery of certain financial reports, certain registration rights, voting provisions regarding the composition of the Company's board of directors, and limitations on the Company's ability to pay dividends, incur additional indebtedness or consummate certain changes of control. The note purchase agreement also contains customary events of default, including bankruptcy, the failure to make payments when due, and certain material adverse changes. Upon the occurrence of an event of default, subject to any specified cure periods, all amounts owed by the Company may be declared immediately due and payable. As of June 30, 2019, the Company was in compliance with all applicable covenants under the note purchase agreement.

Due to certain embedded features within the May 2019 Notes, the Company elected to account for these notes and all their embedded features under the fair value option. For the six months ended

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June 30, 2019, the Company recognized $2.5 million of other expense in the combined statements of operations related to increases in the fair value of the May 2019 Notes. For the six months ended June 30, 2019, the Company recognized $0.8 million of interest expense in connection with the May 2019 Notes. As of June 30, 2019, the outstanding principal and accrued interest on the May 2019 Notes was $90.3 million and $0.8 million, respectively.

**5. Long-Term Debt**

Long-term debt consists of the following (in thousands):

| | June 30, 2019 |
|---|---|
| Long-term debt | $ 25,000 |
| Unamortized debt discount | (2,551) |
| Long-term debt, net of debt discount | $ 22,449 |

On May 14, 2019, the Company entered into a loan and security agreement (the “Loan Agreement”, and all amounts borrowed thereunder the “Term Loans”) with Silicon Valley Bank (“SVB”), as administrative and collateral agent, and lenders including SVB and WestRiver Innovation Lending Fund VIII, L.P. (“WestRiver”). The Company borrowed $25.0 million (“Term Loan A”) at the inception of the Loan Agreement and has the right to borrow an additional $25.0 million (“Term Loan B”). Term Loan B is available through March 31, 2020, provided that (i) the Company has received at least $150.0 million of net cash proceeds in connection with the issuance and sale, subsequent to April 1 2019, of its equity securities and subordinated debt, (ii) the Company has initiated Phase 3 clinical trials for vonoprazan, and (iii) no event of default has occurred.

The Term Loans bear interest at a floating rate of the higher of the Wall Street Journal Prime rate plus 1.75% (7.25% at June 30, 2019) or 7.25%. The monthly payments consist of interest-only through June 1, 2021 or, in the event of positive data with respect to the Company’s Phase 3 clinical trial in both indications for Vonoprazan sufficient to file an NDA with the FDA, through June 1, 2022. Subsequent to the interest-only period, the Term Loans will be payable in equal monthly installments of principal, plus accrued and unpaid interest through the maturity date of May 1, 2024. In addition, the Company is obligated to pay a final payment fee of 8.25% of the original principal amount of the Term Loans. As of June 30, 2019, the final payment fee of $2.1 million has been recorded as an other long-term liability.

The Company may elect to prepay all or a portion of the Term Loans prior to maturity, subject to a prepayment fee of up to 2.0% of the then outstanding principal balance and payment of a pro rata portion of the final payment fee. After repayment, no Term Loan amounts may be borrowed again.

The borrowings under the Loan Agreement are collateralized by substantially all of the Company’s assets, excluding intellectual property and certain other assets. The Loan Agreement includes affirmative and negative covenants. The affirmative covenants include, among others, covenants requiring the Company to maintain its legal existence and governmental approvals, deliver certain financial reports, maintain insurance coverage and satisfy certain requirements regarding its operating accounts. The negative covenants include, among others, limitations on the Company’s

**PHATHOM PHARMACEUTICALS, INC.**
**NOTES TO COMBINED FINANCIAL STATEMENTS—(Continued)**
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ability to incur additional indebtedness and liens, merge with other companies or consummate certain changes of control, acquire other companies, engage in new lines of business, make certain investments, pay dividends, transfer or dispose of assets, amend certain material agreements or enter into various specified transactions. The Loan Agreement also contains customary events of default, including bankruptcy, the failure to make payments when due, and a material adverse change. Upon the occurrence of an event of default, subject to any specified cure periods, all amounts owed by the Company would begin to bear interest at a rate that is 4.00% above the rate effective immediately before the event of default and may be declared immediately due and payable by SVB, as collateral agent. As of June 30, 2019, the Company was in compliance with all applicable covenants under the Loan Agreement.

In connection with the Loan Agreement, the Company issued the Lender Warrants to purchase stock of the Company. The Lender Warrants become exercisable only if the Company borrows Term Loan B, and the number, class and per share price of the shares subject to the warrants is dependent on the terms of certain future equity financing transactions of the Company, including an IPO. The Lender Warrants expire ten years from the date of issuance, subject to earlier termination on September 30, 2020 if the Company does not draw down Term Loan B on or before March 31, 2020. The Lender Warrants include a put option pursuant to which, in the event that the Company does not draw down Term Loan B on or before March 31, 2020, the warrant holders may require that the Company repurchase the warrants for a total aggregate repurchase price of $0.5 million. The put right is exercisable through September 30, 2020.

The initial $0.4 million fair value of the Lender Warrants, the $2.1 million final payment fee and $0.2 million of debt issuance costs have been recorded as debt discount and are being amortized to interest expense using the effective interest method over the term of the Term Loans. For the six months ended June 30, 2019, the Company recognized $0.3 million of interest expense, including amortization of the debt discount, in connection with the Loan Agreement. As of June 30, 2019, the Company had outstanding Term Loans of $25.0 million and accrued interest of $0.2 million.

Future minimum principal and interest payments under the Term Loans, including the final payment fee, as of June 30, 2019 are as follows (in thousands):

| | |
|---|---|
| Year ending December 31: | |
| 2019 | $ 921 |
| 2020 | 1,843 |
| 2021 | 6,609 |
| 2022 | 9,533 |
| 2023 | 8,920 |
| 2024 | 5,599 |
| Total principal and interest payments | 33,425 |
| Less interest and final payment fee | (8,425) |
| Long-term debt | $ 25,000 |

**PHATHOM PHARMACEUTICALS, INC.**
**NOTES TO COMBINED FINANCIAL STATEMENTS—(Continued)**
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## 6. Stockholders' Deficit

### *Common Stock*

In March 2019, subsequent to the Merger, the Company sold 1,491,072 shares of the Company's common stock to Frazier.

In March 2019, the founders granted the Company a repurchase right for the 3,373,408 shares of common stock originally purchased in 2018. The Company has the right, but not the obligation, to repurchase unvested shares in the event the founder's relationship with the Company is terminated, subject to certain limitations, at the original purchase price of the stock. The repurchase right lapses for 843,352 shares in March 2019 and the repurchase right for the remaining 2,530,056 shares lapses in equal monthly amounts over the following 48-month period ending in March 2023. The fair value of the founder shares at the date the repurchase right was granted is being recognized as stock-based compensation expense on a straight-line basis over the vesting period. As of June 30, 2019, 2,371,928 shares of common stock were subject to repurchase by the Company and the associated repurchase liability was not significant. The amount of recognized and unrecognized stock-based compensation related to the founder stock was immaterial for all periods presented.

In May 2019, the Company issued Takeda 1,084,000 shares of common stock in connection with the Takeda License.

For the period from January 1, 2019 to May 6, 2019, the Company issued 2,524,852 shares of common stock to various employees and consultants of the Company for aggregate proceeds of approximately $1,000. Upon issuance, these shares were subject to a repurchase option by the Company at the original purchase price of the shares. The repurchase rights generally lapse as to 25% of the shares on the first anniversary of the vesting commencement date, and the repurchase right lapses as to 1/48$^{th}$ of the shares each one-month period thereafter, subject to the purchaser remaining continuously an employee, consultant or director of the Company.

### *Equity Incentive Plan*

The Company's 2019 Equity Incentive Plan (the "Existing Incentive Plan") provides for the grant of incentive stock options, nonstatutory stock options, stock appreciation rights, restricted stock awards, restricted stock unit awards, and other stock awards to eligible recipients, including employees, directors or consultants of the Company. As of June 30, 2019, the Company had 2,231,739 shares of common stock authorized for issuance under the Existing Incentive Plan, of which 2,215,479 shares remained available for grant. In May 2019, the Company issued 16,260 shares of common stock under a restricted stock award, of which 10,840 were unvested as of June 30, 2019. For the six months ended June 30, 2019, the Company recognized $29,000 of stock-based compensation expense related to restricted stock awards under the Existing Incentive Plan and the grant date fair value of the award was $5.43 per share, the grant date fair value of the Company's common stock.

**PHATHOM PHARMACEUTICALS, INC.**
**NOTES TO COMBINED FINANCIAL STATEMENTS—(Continued)**
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A summary of the Company's unvested shares is as follows:

| | |
|---|---|
| Balance at January 1, 2019 | – |
| Vesting restrictions placed on previously issued shares | 3,373,408 |
| Sale of unvested common stock | 2,524,852 |
| Issuance of unvested restricted stock awards | 16,260 |
| Share vesting | (1,257,270) |
| Balance at June 30, 2019 | 4,657,250 |

For accounting purposes, unvested shares of common stock are considered issued, but not outstanding until they vest.

***Stock-Based Compensation Expense***

Stock-based compensation expense recognized for all equity awards, including founder stock, has been reported in the combined statements of operations as follows (in thousands):

| | Six Months Ended June 30, 2019 |
|---|---|
| Research and development expense | $ – |
| General and administrative expense | 29 |
| Total | $ 29 |

As of June 30, 2019, the Company had $59,000 of unrecognized stock-based compensation expense, which is expected to be recognized over a weighted-average period of 0.7 years. For the six months ended June 30, 2019, the vested fair value of the restricted stock awards was $29,000. There was no stock-based compensation expense for the year ended December 31, 2018.

***Valuation of Common Stock***

Prior to obtaining the Takeda License on May 7, 2019, the fair value of the Company's common stock was nominal since the Company was not sufficiently capitalized and held no assets that could be used to generate future revenues. Subsequent to obtaining the Takeda License and issuing the May 2019 Notes, the Company estimated the fair value of its common stock using methodologies, approaches and assumptions consistent with the American Institute of Certified Public Accountants Accounting and Valuation Guide: *Valuation of Privately Held Company Equity Securities Issued as Compensation* (the "Practice Aid"). The Practice Aid prescribes several valuation approaches for setting the value of an enterprise, such as the cost, income and market approaches, and various methodologies for allocating the value of an enterprise to its common stock. The Company's 2019 valuations utilized a scenario-based analysis that estimated the fair value per share based on the probability-weighted present value of expected future investment returns, considering each of the possible outcomes available to the Company, including various IPO, stay private and dissolution scenarios, and applying a discount for lack of marketability. The Company considered various stay private scenarios using the income approach and allocated the indicated equity value to each class of equity based on the current-value method. The Company also considered various IPO scenarios

**PHATHOM PHARMACEUTICALS, INC.**
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based on expected equity values in an IPO and allocated the indicated equity value to each class of equity on a fully-diluted basis considering the dilutive impacts of the May 2019 Notes and the Lender Warrants.

***Common Stock Reserved for Future Issuance***

Common stock reserved for future issuance consists of the following:

| | June 30, 2019 |
|---|---|
| Common stock warrants | 7,588,000 |
| Shares available for issuance under the Existing Incentive Plan | 2,215,479 |
| Total | 9,803,479 |

As of December 31, 2018, no shares of common stock were reserved for future issuance.

**7. Income Taxes**

A reconciliation between the provision for income taxes and income taxes computed using the U.S. federal statutory corporate tax rate is as follows (in thousands):

| | Year Ended December 31, 2018 |
|---|---|
| Tax computed at federal statutory rate | $ (271) |
| Permanent differences | 14 |
| Change in valuation allowance | 257 |
| Provision for income taxes | $ – |

Significant components of the Company's net deferred tax assets are as follows (in thousands):

| | December 31, 2018 |
|---|---|
| Deferred tax assets: | |
| Net operating loss carryforwards | $ 5 |
| Accruals and reserves | 16 |
| Intangible assets | 236 |
| Total deferred tax assets | 257 |
| Valuation allowance | (257) |
| Net deferred taxes | $ – |

Based upon the Company's history of operating losses, the Company is unable to conclude that it is more likely than not that the benefit of its deferred tax assets will be realized. Accordingly, the Company has provided a full valuation allowance for its deferred tax assets as of December 31, 2018.

**PHATHOM PHARMACEUTICALS, INC.**
**NOTES TO COMBINED FINANCIAL STATEMENTS—(Continued)**
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As of December 31, 2018, the Company had federal net operating loss carryforwards of approximately $23,000, which do not expire, and no material federal or California research and development credits.

Pursuant to Internal Revenue Code Sections 382 and 383, annual use of the Company's net operating loss and research and development tax credit carryforwards may be limited in the event a cumulative change in ownership of more than 50% occurs within a three-year period. The Company has not completed a Section 382 study to assess whether an ownership change has occurred or whether there have been multiple ownership changes since the Company's formation. If eliminated, the related asset would be removed from the deferred tax asset schedule with a corresponding reduction in the valuation allowance. Due to the existence of the valuation allowance, limitations created by future ownership changes, if any, will not impact the Company's effective tax rate.

As of December 31, 2018, there were no material unrecognized tax benefits recorded in the combined financial statements and the Company does not anticipate any significant changes in its unrecognized tax benefits over the next 12 months.

The Company is subject to taxation in the United States federal and state jurisdictions. The Company has not yet filed federal income tax and state income tax returns, but upon filing will be subject to examination by federal and state tax authorities due to the carryforward of unutilized net operating losses and research and development credits. The Company is not currently under examination by any tax authority. The Company's policy is to recognize interest and penalties related to income tax matters as a component of income tax expense. The Company has not recognized interest or penalties in its combined statements of operations since inception.

**8. Subsequent Events**

For purposes of the financial statements as of December 31, 2018 and for the year then ended, and the interim financial statements as of June 30, 2019 and for the six months then ended, the Company has completed an evaluation of all subsequent events through July 26, 2019 to ensure these financial statements include appropriate disclosure of events both recognized in the financial statements and events which occurred but were not recognized in the financial statements. The Company has further evaluated subsequent events for disclosure purposes through October 15, 2019. Except as described below, the Company has concluded that no subsequent event has occurred that requires disclosure.

***2019 Incentive Award Plan***

In October 2019, the board of directors adopted, and the Company's stockholders approved the 2019 Equity Incentive Plan (the "2019 Plan"), which will become effective in connection with this offering. Under the 2019 Plan, the Company may grant stock options, stock appreciation rights, restricted stock, restricted stock units and other awards to individuals who are then employees, officers, non-employee directors or consultants of the Company or its subsidiaries. An aggregate of 2,700,000 shares of the Company's common stock will initially be available for issuance under awards granted pursuant to the 2019 Plan. The number of shares initially available for issuance will be increased by (i) the number of shares subject to stock options or similar awards granted under the Existing Incentive Plan that expire or otherwise terminate without having been exercised in full after the

effective date of the 2019 Plan and unvested shares issued pursuant to awards granted under the Existing Incentive Plan that are forfeited to or repurchased by the Company after the effective date of the 2019 Plan, with the maximum number of shares to be added to the 2019 Plan pursuant to clause (i) above equal to 1,416,788 shares, and (ii) an annual increase on January 1 of each calendar year beginning in 2020 and ending in 2029, equal to the lesser of (a) 5% of the shares of common stock outstanding on the final day of the immediately preceding calendar year and (b) such smaller number of shares as determined by the board of directors.

***Approval of the Employee Stock Purchase Plan***

In October 2019, the board of directors adopted, and the Company's stockholders approved, the Employee Stock Purchase Plan (the "ESPP"), which will become effective in connection with this offering. The ESPP permits participants to purchase common stock through payroll deductions of up to 20% of their eligible compensation, which includes a participant's gross base compensation for services to the Company, including overtime payments and excluding sales commissions, incentive compensation, bonuses, expense reimbursements, fringe benefits and other special payments. A total of 270,000 shares of common stock is initially reserved for issuance under the ESPP. In addition, the number of shares available for issuance under the ESPP will be annually increased on January 1 of each calendar year beginning in 2020 and ending in 2029, by an amount equal to the lesser of: (i) 1% of the shares outstanding on the final day of the immediately preceding calendar year and (ii) such smaller number of shares as is determined by the board of directors.

***Forward Stock Split***

On October 11, 2019, the Company effected a 2.168-for-1 forward stock split of its common stock (the "Forward Stock Split"). The par value of the common stock was not adjusted as a result of the Forward Stock Split and the authorized shares were increased to 50,000,000 shares of common stock in connection with the Forward Stock Split. The accompanying combined financial statements and notes to the combined financial statements give retroactive effect to the Forward Stock Split for all periods presented, unless otherwise indicated.

7,900,000 Shares

# Phathom Pharmaceuticals, Inc.

Common Stock


**Goldman Sachs & Co. LLC** **Jefferies** **Evercore ISI**

**Needham & Company**

**Through and including , 2019 (the 25th day after the date of this prospectus) all dealers that effect transactions in these securities, whether or not participating in this offering, may be required to deliver a prospectus. This is in addition to the dealers' obligation to deliver a prospectus when acting as underwriters and with respect to their unsold allotments or subscriptions.**

## Part II

## INFORMATION NOT REQUIRED IN PROSPECTUS

### Item 13. Other Expenses of Issuance and Distribution.

The following table indicates the expenses to be incurred in connection with the offering described in this registration statement, other than underwriting discounts and commissions, all of which will be paid by us. All amounts are estimated except the SEC registration fee, the Financial Industry Regulatory Authority, Inc., or FINRA, filing fee and the Nasdaq Global Market listing fee.

| | Amount paid or to be paid |
|---|---|
| SEC registration fee | $ 23,585 |
| FINRA filing fee | 27,755 |
| Nasdaq Global Market listing fee | 150,000 |
| Accountants' fees and expenses | 425,000 |
| Legal fees and expenses | 1,550,000 |
| Transfer Agent's fees and expenses | 3,500 |
| Printing and engraving expenses | 450,000 |
| Miscellaneous | 170,160 |
| Total expenses | $ 2,800,000 |

### Item 14. Indemnification of Directors and Officers.

Section 102 of the General Corporation Law of the State of Delaware permits a corporation to eliminate the personal liability of directors of a corporation to the corporation or its stockholders for monetary damages for a breach of fiduciary duty as a director, except where the director breached his duty of loyalty, failed to act in good faith, engaged in intentional misconduct or knowingly violated a law, authorized the payment of a dividend or approved a stock repurchase in violation of Delaware corporate law or obtained an improper personal benefit. Our certificate of incorporation provides that no director of the Registrant shall be personally liable to it or its stockholders for monetary damages for any breach of fiduciary duty as a director, notwithstanding any provision of law imposing such liability, except to the extent that the General Corporation Law of the State of Delaware prohibits the elimination or limitation of liability of directors for breaches of fiduciary duty.

Section 145 of the General Corporation Law of the State of Delaware provides that a corporation has the power to indemnify a director, officer, employee or agent of the corporation, or a person serving at the request of the corporation for another corporation, partnership, joint venture, trust or other enterprise in related capacities against expenses (including attorneys' fees), judgments, fines and amounts paid in settlement actually and reasonably incurred by the person in connection with an action, suit or proceeding to which he was or is a party or is threatened to be made a party to any threatened, ending or completed action, suit or proceeding by reason of such position, if such person acted in good faith and in a manner he reasonably believed to be in or not opposed to the best interests of the corporation, and, in any criminal action or proceeding, had no reasonable cause to believe his conduct was unlawful, except that, in the case of actions brought by or in the right of the corporation, no indemnification shall be made with respect to any claim, issue or matter as to which such person shall have been adjudged to be liable to the corporation unless and only to the extent that the Court of Chancery or other adjudicating court determines that, despite the adjudication of liability but in view of all of the circumstances of the case, such person is fairly and reasonably entitled to indemnity for such expenses which the Court of Chancery or such other court shall deem proper.

Our amended and restated certificate of incorporation, which will become effective immediately prior to the closing of this offering, provides that we will indemnify each person who was or is a party or threatened to be made a party to any threatened, pending or completed action, suit or proceeding (other than an action by or in the right of us) by reason of the fact that he or she is or was, or has agreed to become, a director or officer, or is or was serving, or has agreed to serve, at our request as a director, officer, partner, employee or trustee of, or in a similar capacity with, another corporation, partnership, joint venture, trust or other enterprise (all such persons being referred to as an "Indemnitee"), or by reason of any action alleged to have been taken or omitted in such capacity, against all expenses (including attorneys' fees), judgments, fines and amounts paid in settlement actually and reasonably incurred in connection with such action, suit or proceeding and any appeal therefrom, if such Indemnitee acted in good faith and in a manner he or she reasonably believed to be in, or not opposed to, our best interests, and, with respect to any criminal action or proceeding, he or she had no reasonable cause to believe his or her conduct was unlawful. Our amended and restated certificate of incorporation provides that we will indemnify any Indemnitee who was or is a party to an action or suit by or in the right of us to procure a judgment in our favor by reason of the fact that the Indemnitee is or was, or has agreed to become, a director or officer, or is or was serving, or has agreed to serve, at our request as a director, officer, partner, employee or trustee of, or in a similar capacity with, another corporation, partnership, joint venture, trust or other enterprise, or by reason of any action alleged to have been taken or omitted in such capacity, against all expenses (including attorneys' fees) and, to the extent permitted by law, amounts paid in settlement actually and reasonably incurred in connection with such action, suit or proceeding, and any appeal therefrom, if the Indemnitee acted in good faith and in a manner he or she reasonably believed to be in, or not opposed to, our best interests, except that no indemnification shall be made with respect to any claim, issue or matter as to which such person shall have been adjudged to be liable to us, unless a court determines that, despite such adjudication but in view of all of the circumstances, he or she is entitled to indemnification of such expenses. Notwithstanding the foregoing, to the extent that any Indemnitee has been successful, on the merits or otherwise, he or she will be indemnified by us against all expenses (including attorneys' fees) actually and reasonably incurred in connection therewith. Expenses must be advanced to an Indemnitee under certain circumstances.

We have entered into indemnification agreements with each of our directors and officers. These indemnification agreements may require us, among other things, to indemnify our directors and officers for some expenses, including attorneys' fees, judgments, fines and settlement amounts incurred by a director or officer in any action or proceeding arising out of his or her service as one of our directors or officers, or any of our subsidiaries or any other company or enterprise to which the person provides services at our request.

We maintain a general liability insurance policy that covers certain liabilities of directors and officers of our corporation arising out of claims based on acts or omissions in their capacities as directors or officers.

In any underwriting agreement we enter into in connection with the sale of common stock being registered hereby, the underwriters will agree to indemnify, under certain conditions, us, our directors, our officers and persons who control us within the meaning of the Securities Act, against certain liabilities.

**Item 15. Recent Sales of Unregistered Securities.**

Set forth below is information regarding unregistered securities issued by us since January 1, 2018. Also included is the consideration received by us for such securities and information relating to the section of the Securities Act, or rule of the SEC, under which exemption from registration was claimed.

(a) Issuances of Securities

1. From January 2018 to December 2018, YamadaCo IIA, Inc. issued convertible promissory notes, or the YamadaCo Notes, in an aggregate principal amount of $1.5 million to Frazier Life Sciences IX, L.P., or FLS IX. From January 2018 to April 2019, we (originally as North Bridge IV, Inc.) issued convertible promissory notes, or the Phathom Notes, in an aggregate principal amount of $0.9 million to FLS IX. On May 7, 2019, the YamadaCo Notes and the Phathom Notes were cancelled in exchange for newly issued convertible promissory notes in the principal amount of approximately $2.4 million, which amount represented the principal and accrued interest on the YamadaCo Notes and the Phathom Notes as of such date.

2. In February 2018, we issued 1,000 shares of common stock to our founders and entities affiliated with them at a purchase price of $1.00 per share pursuant to stock purchase agreements. In March 2019, we effected a 1,559.1183-for-1 forward stock split for each outstanding share of our common stock, resulting in 1,559,118 shares of our common stock held by such founders and entities affiliated with them. In October 2019, we effected a 2.168-for-1 forward stock split for each outstanding share of our common stock, resulting in 3,380,167 shares of our common stock held by such founders and entities affiliated with them.

3. From January 2018 to February 2018, YamadaCo IIA, Inc. issued 1,000 shares of its common stock to its founders and entities affiliated with them at a purchase price of $1.00 per share pursuant to stock purchase agreements. In March 2019, effective upon the completion of the merger of YamadaCo IIA, Inc. with and into us, each issued and outstanding share of YamadaCo IIA, Inc. was converted into 1559.1183 shares of our common stock, resulting in 1,559,118 shares of our common stock held by such founders and entities affiliated with them. In October 2019, we effected a 2.168-for-1 forward stock split for each outstanding share of our common stock, resulting in 3,380,167 shares of our common stock held by such founders and entities affiliated with them.

4. In March 2019, we issued 1,491,072 shares of common stock to FLS IX at a purchase price of $0.0002958 per share pursuant to a stock purchase agreement.

5. In May 2019, we issued 1,084,000 shares of common stock to Takeda pursuant to a stock issuance agreement and a warrant to purchase 7,588,000 shares of our common stock with an exercise price of $0.00004613 per share as partial consideration for the Takeda License.

6. In May 2019, we issued convertible promissory notes in an aggregate principal amount of $90.3 million to FLS IX and other investors pursuant to a note purchase agreement.

7. In May 2019, we issued warrants to Silicon Valley Bank and WestRiver Innovation Lending Fund VIII, L.P., the number, class and exercise price of which are dependent on the terms of certain future equity financing transactions.

No underwriters were involved in the foregoing issuances of securities. The securities described in this section (a) of Item 15 were issued to investors in reliance upon the exemption from the registration requirements of the Securities Act, as set forth in Section 4(a)(2) under the Securities Act and Regulation D promulgated thereunder relative to transactions by an issuer not involving any public offering, to the extent an exemption from such registration was required. All holders of securities described above represented to us in connection with their purchase or issuance that they were accredited investors and were acquiring the securities for their own account for investment purposes only and not with a view to, or for sale in connection with, any distribution thereof and that they could bear the risks of the investment and could hold the securities for an indefinite period of time. The holders received written disclosures that the securities had not been registered under the Securities Act and that any resale must be made pursuant to a registration statement or an available exemption from such registration.

(b) Grants of Restricted Stock and Stock Options

1. In March 2019, we issued 1,743,072 shares of our restricted common stock to certain of our founders at a purchase price of $0.0002958 per share pursuant to restricted stock purchase agreements.

2. From April 2019 to May 2019, we issued 781,780 shares of our restricted common stock to certain of our employees and consultants at a purchase price of $0.0002958 per share pursuant to restricted stock purchase agreements.

3. In May 2019, we granted 16,260 shares of our restricted common stock under our existing 2019 equity incentive plan to a consultant in connection with services provided to us by such person.

4. In August 2019, we granted stock options to purchase an aggregate of 906,224 shares of our common stock at a price of $6.95 per share, to certain of our employees and directors in connection with services provided to us by such persons.

5. In September 2019, we granted stock options to purchase an aggregate of 494,304 shares of our common stock at a price of $13.04 per share, to certain of our employees and directors in connection with services provided to us by such persons.

The restricted stock, stock options and the common stock issuable upon the exercise of such options as described in this section (b) of Item 15 were issued pursuant to written compensatory plans or arrangements with our employees and directors, in reliance on the exemption from the registration requirements of the Securities Act provided by Rule 701 promulgated under the Securities Act or the exemption set forth in Section 4(a)(2) under the Securities Act and Regulation D promulgated thereunder relative to transactions by an issuer not involving any public offering. All recipients either received adequate information about us or had access, through employment or other relationships, to such information.

All of the foregoing securities are deemed restricted securities for purposes of the Securities Act. All certificates representing the issued shares of capital stock described in this Item 15 included appropriate legends setting forth that the securities had not been registered and the applicable restrictions on transfer.

**Item 16. Exhibits and Financial Statement Schedules.**

(a) **Exhibits.** See Exhibit Index attached to this registration statement, which is incorporated by reference herein.

(b) **Financial Statement Schedules.** Schedules not listed above have been omitted because the information required to be set forth therein is not applicable or is shown in the combined financial statements or notes thereto.

**Item 17. Undertakings.**

The undersigned registrant hereby undertakes to provide to the underwriter, at the closing specified in the underwriting agreement, certificates in such denominations and registered in such names as required by the underwriter to permit prompt delivery to each purchaser.

Insofar as indemnification for liabilities arising under the Securities Act may be permitted to directors, officers and controlling persons of the registrant pursuant to the foregoing provisions, or otherwise, the registrant has been advised that in the opinion of the SEC such indemnification is against public policy as expressed in the Securities Act and is, therefore, unenforceable. In the event

that a claim for indemnification against such liabilities (other than the payment by the registrant of expenses incurred or paid by a director, officer or controlling person of the registrant in the successful defense of any action, suit or proceeding) is asserted by such director, officer or controlling person in connection with the securities being registered, the registrant will, unless in the opinion of its counsel the matter has been settled by controlling precedent, submit to a court of appropriate jurisdiction the question whether such indemnification by it is against public policy as expressed in the Securities Act and will be governed by the final adjudication of such issue.

The undersigned hereby undertakes that:

(1) For purposes of determining any liability under the Securities Act, the information omitted from the form of prospectus filed as part of this registration statement in reliance upon Rule 430A and contained in a form of prospectus filed by the registrant pursuant to Rule 424(b)(1) or (4) or 497(h) under the Securities Act shall be deemed to be part of this registration statement as of the time it was declared effective.

(2) For the purpose of determining any liability under the Securities Act, each post-effective amendment that contains a form of prospectus shall be deemed to be a new registration statement relating to the securities offered therein, and the offering of such securities at that time shall be deemed to be the initial bona fide offering thereof.

The undersigned registrant hereby undertakes that, for the purpose of determining liability under the Securities Act of 1933 to any purchaser, each prospectus filed pursuant to Rule 424(b) as part of a registration statement relating to an offering, other than registration statements relying on Rule 430B or other than prospectuses filed in reliance on Rule 430A, shall be deemed to be part of and included in the registration statement as of the date it is first used after effectiveness. Provided, however, that no statement made in a registration statement or prospectus that is part of the registration statement or made in a document incorporated or deemed incorporated by reference into the registration statement or prospectus that is part of the registration statement will, as to a purchaser with a time of contract of sale prior to such first use, supersede or modify any statement that was made in the registration statement or prospectus that was part of the registration statement or made in any such document immediately prior to such date of first use.

The undersigned registrant hereby undertakes that, for the purpose of determining liability of the registrant under the Securities Act of 1933 to any purchaser in the initial distribution of the securities in a primary offering of securities of the undersigned registrant pursuant to this registration statement, regardless of the underwriting method used to sell the securities to the purchaser, if the securities are offered or sold to such purchaser by means of any of the following communications, the undersigned registrant will be a seller to the purchaser and will be considered to offer or sell such securities to such purchaser:

(1) Any preliminary prospectus or prospectus of the undersigned registrant relating to the offering required to be filed pursuant to Rule 424;

(2) Any free writing prospectus relating to the offering prepared by or on behalf of the undersigned registrant or used or referred to by the undersigned registrant;

(3) The portion of any other free writing prospectus relating to the offering containing material information about the undersigned registrant or its securities provided by or on behalf of the undersigned registrant; and

(4) Any other communication that is an offer in the offering made by the undersigned registrant to the purchaser.

## Exhibit Index

| Exhibit Number | Description of Exhibit |
|---|---|
| 1.1 | Form of Underwriting Agreement |
| 2.1** | Agreement of Merger, dated March 13, 2019, by and between YamadaCo IIA, Inc. and the Registrant |
| 3.1 | Amended and Restated Certificate of Incorporation, as amended (currently in effect) |
| 3.2** | Bylaws, as amended (currently in effect) |
| 3.3** | Form of Amended and Restated Certificate of Incorporation (to be effective immediately prior to the closing of this offering) |
| 3.4** | Form of Amended and Restated Bylaws (to be effective immediately prior to the closing of this offering) |
| 4.1 | Specimen stock certificate evidencing the shares of common stock |
| 4.2** | Warrant to purchase shares of common stock issued to Takeda Pharmaceutical Company Limited, dated May 7, 2019 |
| 4.3** | Warrant to purchase stock issued to Silicon Valley Bank, dated May 14, 2019 |
| 4.4** | Warrant to purchase stock issued to WestRiver Innovation Lending Fund VIII, L.P., dated May 14, 2019 |
| 4.5 | Note Purchase Agreement, dated May 7, 2019, by and among the Registrant and the other parties party thereto, as amended |
| 5.1 | Opinion of Latham & Watkins LLP |
| 10.1#** | Phathom Pharmaceuticals, Inc. 2019 Equity Incentive Plan |
| 10.2#** | Form of Stock Option Grant Notice and Stock Option Agreement under Phathom Pharmaceuticals, Inc. 2019 Equity Incentive Plan |
| 10.3#** | Form of Restricted Stock Grant Notice and Restricted Stock Agreement under Phathom Pharmaceuticals, Inc. 2019 Equity Incentive Plan |
| 10.4# | Phathom Pharmaceuticals, Inc. 2019 Incentive Award Plan and form of stock option grant notice and stock option agreement thereunder |
| 10.5# | Phathom Pharmaceuticals, Inc. 2019 Employee Stock Purchase Plan |
| 10.6# | Non-Employee Director Compensation Program |
| 10.7#** | Letter Agreement, dated May 7, 2019, by and between Tadataka Yamada, M.D. and the Registrant |
| 10.8#** | Employment Letter Agreement, dated July 21, 2019, by and between David Socks and the Registrant |
| 10.9#** | Amended and Restated Employment Letter Agreement, dated September 25, 2019, by and between Azmi Nabulsi, M.D., M.P.H. and the Registrant |
| 10.10#** | Employment Letter Agreement, dated July 23, 2019, by and between Aditya Kohli, Ph.D. and the Registrant |
| 10.11#** | Form of Indemnification Agreement for Directors and Officers |
| 10.12†** | License Agreement, dated May 7, 2019, by and between Takeda Pharmaceutical Company Limited and the Registrant |
| 10.13** | Loan and Security Agreement, dated May 14, 2019, by and among Silicon Valley Bank, WestRiver Innovation Lending Fund VIII, L.P. and the Registrant |
| 10.14#** | Employment Letter Agreement, dated August 29, 2019, by and between Terrie Curran and the Registrant |
| 23.1 | Consent of independent registered public accounting firm |
| 23.2 | Consent of Latham & Watkins LLP (included in Exhibit 5.1) |
| 24.1** | Power of Attorney (included on signature page) |

** Previously filed.
# Indicates management contract or compensatory plan.
† Portions of this exhibit have been omitted for confidentiality purposes.

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## SIGNATURES

Pursuant to the requirements of the Securities Act, the registrant has duly caused this registration statement to be signed on its behalf by the undersigned, thereunto duly authorized, in the City of San Diego, State of California, on this 15th day of October, 2019.

PHATHOM PHARMACEUTICALS, INC.

By: /s/ David Socks
David Socks
President, Chief Executive Officer and Director

## SIGNATURES

Pursuant to the requirements of the Securities Act of 1933, this registration statement has been signed by the following persons in the capacities held on the dates indicated.

| Signature | Title | Date |
|---|---|---|
| /s/ David Socks<br>David Socks | President, Chief Executive Officer and Director (principal executive officer) | October 15, 2019 |
| /s/ Aditya Kohli, Ph.D.<br>Aditya Kohli, Ph.D. | Chief Business Officer (principal financial and accounting officer) | October 15, 2019 |
| *<br>Tadataka Yamada, M.D. | Chairman | October 15, 2019 |
| *<br>Michael F. Cola | Director | October 15, 2019 |
| *<br>Terrie Curran | Director | October 15, 2019 |
| *<br>Jonathan Edwards, Ph.D. | Director | October 15, 2019 |
| *<br>Heidi Kunz | Director | October 15, 2019 |
| *<br>Chris Slavinsky | Director | October 15, 2019 |
| *<br>James Topper, M.D., Ph.D. | Director | October 15, 2019 |

*By: /s/ David Socks
David Socks
Attorney-in-Fact

**Exhibit 1.1**

**Phathom Pharmaceuticals, Inc.**

**Common Stock, par value $0.0001 per share**

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***Underwriting Agreement***

[●], 2019

Goldman Sachs & Co. LLC
Jefferies LLC
Evercore Group L.L.C.

As representatives (the "Representatives") of the several Underwriters
named in Schedule I hereto,

c/o Goldman Sachs & Co. LLC
200 West Street
New York, New York 10282

c/o Jefferies LLC
520 Madison Avenue
New York, New York 10022

c/o Evercore Group L.L.C.
55 East 52nd Street
New York, New York 10055

Ladies and Gentlemen:

Phathom Pharmaceuticals, Inc., a Delaware corporation (the "Company"), proposes, subject to the terms and conditions stated in this agreement (this "Agreement"), to issue and sell to the several Underwriters named in Schedule I hereto (the "Underwriters") for whom you are acting as representatives (the "Representatives") an aggregate of [●] shares (the "Firm Shares") and, at the election of the Underwriters, up to [●] additional shares (the "Optional Shares") of common stock, par value $0.0001 per share ("Stock"), of the Company (the Firm Shares and the Optional Shares that the Underwriters elect to purchase pursuant to Section 2 hereof being collectively called the "Shares").

Goldman Sachs & Co. LLC (the "Directed Share Underwriter") has agreed to reserve up to [●] Shares of the Firm Shares to be purchased by it under this Agreement for sale at the direction of the Company to certain parties related to the Company (collectively, "Participants"). The Shares to be sold by the Directed Share Underwriter pursuant to the Directed Share Program, at the direction of the Company, are hereinafter called the "Directed Shares." Any Directed Shares not confirmed for purchase by the deadline established therefor by the Directed Share Underwriter in consultation with the Company will be offered to the public by the Underwriters as set forth in the Prospectus.

1. The Company represents and warrants to, and agrees with, each of the Underwriters that:

(a) A registration statement on Form S-1 (File No. 333–234020) (the "Initial Registration Statement") in respect of the Shares has been filed with the Securities and Exchange Commission (the "Commission"); the Initial Registration Statement and any post-effective amendment thereto, each in the form heretofore delivered to you, have been declared effective by the Commission in such form; other than a registration statement, if any, increasing the size of the offering (a "Rule 462(b) Registration Statement"), filed pursuant to Rule 462(b) under the Securities Act of 1933, as amended (the "Act"), which became effective upon filing, no other document with respect to the Initial Registration Statement has been filed with the Commission; and no stop order suspending the effectiveness of the Initial Registration Statement, any post-effective amendment thereto or the Rule 462(b) Registration Statement, if any, has been issued and no proceeding for that purpose has been initiated or threatened by the Commission (any preliminary prospectus included in the Initial Registration Statement or filed with the Commission pursuant to Rule 424(a) of the rules and regulations of the Commission under the Act is hereinafter called a "Preliminary Prospectus"; the various parts of the Initial Registration Statement and the Rule 462(b) Registration Statement, if any, including all exhibits thereto and including the information contained in the form of final prospectus filed with the Commission pursuant to Rule 424(b) under the Act in accordance with Section 5(a) hereof and deemed by virtue of Rule 430A under the Act to be part of the Initial Registration Statement at the time it was declared effective, each as amended at the time such part of the Initial Registration Statement became effective or such part of the Rule 462(b) Registration Statement, if any, became or hereafter becomes effective, are hereinafter collectively called the "Registration Statement"; the Preliminary Prospectus relating to the Shares that was included in the Registration Statement immediately prior to the Applicable Time (as defined in Section 1(c) hereof) is hereinafter called the "Pricing Prospectus"; such final prospectus, in the form first filed pursuant to Rule 424(b) under the Act, is hereinafter called the "Prospectus"; any oral or written communication with potential investors undertaken in reliance on Section 5(d) of the Act is hereinafter called a "Section 5(d) Communication"; any Section 5(d) Communication that is a written communication within the meaning of Rule 405 under the Act is hereinafter called a "Section 5(d) Writing"; and any "issuer free writing prospectus" as defined in Rule 433 under the Act relating to the Shares is hereinafter called an "Issuer Free Writing Prospectus");

(b) (A) No order preventing or suspending the use of any Preliminary Prospectus or any Issuer Free Writing Prospectus has been issued by the Commission, and (B) each Preliminary Prospectus, at the time of filing thereof, conformed in all material respects to the requirements of the Act and the rules and regulations of the Commission thereunder, and did not contain an untrue statement of a material fact or omit to state a material fact required to be stated therein or necessary to make the statements therein, in the light of the circumstances under which they were made, not misleading; *provided*, *however*, that this representation and warranty shall not apply to any statements or omissions made in reliance upon and in conformity with the Underwriter Information (as defined in Section 9(b) of this Agreement);

(c) For the purposes of this Agreement, the "Applicable Time" is [●] p.m. (Eastern time) on the date of this Agreement. The Pricing Prospectus, as supplemented by the information listed on Schedule II(c) hereto, taken together (collectively, the "Pricing Disclosure Package"), as of the Applicable Time, did not, and as of each Time of Delivery

(as defined in Section 4(a) of this Agreement) will not, include any untrue statement of a material fact or omit to state any material fact necessary in order to make the statements therein, in the light of the circumstances under which they were made, not misleading; and each Issuer Free Writing Prospectus and each Section 5(d) Writing does not conflict with the information contained in the Registration Statement, the Pricing Prospectus or the Prospectus and each Issuer Free Writing Prospectus, and each Section 5(d) Writing, as supplemented by and taken together with the Pricing Disclosure Package, as of the Applicable Time, did not, and as of each Time of Delivery will not, include any untrue statement of a material fact or omit to state any material fact necessary in order to make the statements therein, in the light of the circumstances under which they were made, not misleading; provided, however, that this representation and warranty shall not apply to statements or omissions made in reliance upon and in conformity with the Underwriter Information;

(d) The Registration Statement conforms, and the Prospectus and any further amendments or supplements to the Registration Statement and the Prospectus will conform, in all material respects to the requirements of the Act and the rules and regulations of the Commission thereunder and do not and will not, as of the applicable effective date as to each part of the Registration Statement, as of the applicable filing date as to the Prospectus and any amendment or supplement thereto, and as of each Time of Delivery, contain an untrue statement of a material fact or omit to state a material fact required to be stated therein or necessary to make the statements therein not misleading; provided, however, that this representation and warranty shall not apply to any statements or omissions made in reliance upon and in conformity with the Underwriter Information;

(e) The Company has not, since the date of the latest audited financial statements included in the Pricing Disclosure Package and the Prospectus, (i) sustained any material loss or interference with its business from fire, explosion, flood or other calamity, whether or not covered by insurance, or from any labor dispute or court or governmental action, order or decree or (ii) entered into any transaction or agreement (whether or not in the ordinary course of business) that is material to the Company or incurred any liability or obligation, direct or contingent, that is material to the Company, in each case otherwise than as set forth or contemplated in the Pricing Disclosure Package and the Prospectus; and, since the respective dates as of which information is given in the Registration Statement and the Pricing Disclosure Package and the Prospectus, there has not been (x) any change in the capital stock (other than as a result of (i) the exercise, if any, of stock options or the award, if any, of stock options or restricted stock in the ordinary course of business pursuant to the Company's equity plans that are described in the Pricing Disclosure Package and the Prospectus or (ii) the issuance, if any, of stock upon conversion of Company securities as described in the Pricing Disclosure Package and the Prospectus) or long-term debt of the Company or (y) any Material Adverse Effect (as defined below); as used in this Agreement, "Material Adverse Effect" shall mean any material adverse change or effect, or any development involving a prospective material adverse change or effect, in or affecting (i) the business, properties, general affairs, management, financial position, stockholders' equity, prospects or results of operations of the Company, except as set forth or contemplated in the Pricing Disclosure Package or the Prospectus, or (ii) the ability of the Company to perform its obligations under this Agreement, including the issuance and sale of the Shares, or to consummate the transactions contemplated in the Pricing Disclosure Package and the Prospectus;

(f) The Company does not own any real property and has good and marketable title to all personal property owned by it, in each case free and clear of all liens, encumbrances and defects except such as are described in the Pricing Disclosure Package and the Prospectus or such as do not materially affect the value of such property and do not interfere with the use made and proposed to be made of such property by the Company; and any real property and buildings held under lease by the Company are, to the Company's knowledge, held by the Company under valid, subsisting and enforceable leases with such exceptions as are not material and do not materially interfere with the use made and proposed to be made of such property and buildings by the Company;

(g) The Company has been (i) duly incorporated and is validly existing and in good standing under the laws of the State of Delaware, with power and authority (corporate and other) to own and/or lease its properties and conduct its business as described in the Pricing Disclosure Package and the Prospectus, and (ii) duly qualified as a foreign corporation for the transaction of business and is in good standing under the laws of each other jurisdiction in which it owns or leases properties or conducts any business so as to require such qualification, except, in the case of this clause (ii), where the failure to be so qualified or in good standing would not, individually or in the aggregate, reasonably be expected to have a Material Adverse Effect;

(h) The Company has no subsidiaries;

(i) The Company has an authorized capitalization as set forth in the Pricing Disclosure Package and the Prospectus and all of the issued shares of capital stock of the Company have been duly and validly authorized and issued and are fully paid and non-assessable and conform to the description of the Stock contained in the Pricing Disclosure Package and Prospectus;

(j) The Shares to be issued and sold by the Company to the Underwriters hereunder have been duly and validly authorized and, when issued and delivered against payment therefor as provided herein, will be duly and validly issued and fully paid and non-assessable and will conform to the description of the Stock contained in the Pricing Disclosure Package and the Prospectus; and the issuance of the Shares is not subject to any preemptive or similar rights that have not been complied with or otherwise effectively waived;

(k) The issue and sale of the Shares and the compliance by the Company with this Agreement and the consummation by the Company of the transactions contemplated in this Agreement and the Pricing Disclosure Package and the Prospectus will not conflict with or result in a breach or violation of any of the terms or provisions of, or constitute a default under, (A) any indenture, mortgage, deed of trust, loan agreement or other agreement or instrument to which the Company is a party or by which the Company is bound or to which any of the property or assets of the Company is subject, (B) the certificate of incorporation or by-laws (or other applicable organizational document) of the Company, or (C) any statute or any judgment, order, rule or regulation of any court or governmental agency or body having jurisdiction over the Company or any of its properties except, in the case of clauses (A) and (C), for such defaults, breaches, or violations that would not, individually or in the aggregate, reasonably be expected to have a Material Adverse Effect; and no consent, approval, authorization, order, registration or qualification of or with any such court or governmental agency or body is required for the issue and sale of the Shares or the consummation by the Company of the transactions contemplated by this Agreement,

except (X) such as have been obtained under the Act, the approval by the Financial Industry Regulatory Authority ("FINRA") of the underwriting terms and arrangements and such consents, approvals, authorizations, registrations or qualifications as may be required under state securities or Blue Sky laws in connection with the purchase and distribution of the Shares by the Underwriters and (Y) such as have been obtained under the laws and regulations of jurisdictions outside the United States in which the Directed Shares were offered;

(l) The Company is not (i) in violation of its certificate of incorporation or by-laws (or other applicable organizational document), (ii) in violation of any statute or any judgment, order, rule or regulation of any court or governmental agency or body having jurisdiction over the Company or any of its properties, or (iii) in default in the performance or observance of any obligation, agreement, covenant or condition contained in any indenture, mortgage, deed of trust, loan agreement, lease or other agreement or instrument to which it is a party or by which it or any of its properties may be bound, except, in the case of the foregoing clauses (ii) and (iii), for such defaults as would not, individually or in the aggregate, reasonably be expected to have a Material Adverse Effect;

(m) The statements set forth in the Pricing Disclosure Package and Prospectus under the captions "Description of Capital Stock" and "Shares Eligible for Future Sale", insofar as they purport to constitute a summary of the terms of the Stock, and under the captions "Material United States Federal Income Tax Consequences to Non-U.S. Holders", and "Underwriting", insofar as they purport to describe the provisions of the laws and documents referred to therein, are accurate, complete and fair in all material respects;

(n) Other than as set forth in the Pricing Disclosure Package and the Prospectus, there are no legal or governmental proceedings pending to which the Company or, to the Company's knowledge, any officer or director of the Company, is a party or of which any property of the Company or, to the Company's knowledge, any officer or director of the Company, is the subject which, if determined adversely to the Company, would individually or in the aggregate, reasonably be expected to have a Material Adverse Effect; and, to the Company's knowledge, no such proceedings are threatened or contemplated by governmental authorities or others;

(o) The Company is not and, after giving effect to the offering and sale of the Shares and the application of the proceeds thereof as described in the Pricing Disclosure Package and the Prospectus, will not be an "investment company", as such term is defined in the Investment Company Act of 1940, as amended (the "Investment Company Act");

(p) At the time of filing the Initial Registration Statement and any post-effective amendment thereto, at the earliest time thereafter that the Company or any offering participant made a bona fide offer (within the meaning of Rule 164(h)(2) under the Act) of the Shares, and at the date hereof, the Company was not and is not an "ineligible issuer," as defined under Rule 405 under the Act;

(q) Ernst & Young LLP, who have certified certain financial statements of the Company, are independent public accountants as required by the Act and the rules and regulations of the Commission thereunder;

(r) The Company maintains a system of internal control over financial reporting (as such term is defined in Rule 13a-15(f) under the Securities Exchange Act of 1934, as

amended (the "Exchange Act")) that (i) complies with the requirements of the Exchange Act, (ii) has been designed by the Company's principal executive officer and principal financial officer, or under their supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with U.S. generally accepted accounting principles ("GAAP") and (iii) is sufficient to provide reasonable assurance that (A) transactions are executed in accordance with management's general or specific authorization, (B) transactions are recorded as necessary to permit preparation of financial statements in conformity with generally accepted accounting principles and to maintain accountability for assets, (C) access to assets is permitted only in accordance with management's general or specific authorization and (D) the recorded accountability for assets is compared with the existing assets at reasonable intervals and appropriate action is taken with respect to any differences; and the Company's internal control over financial reporting is effective and the Company is not aware of any material weaknesses in its internal control over financial reporting (it being understood that this subsection shall not require the Company to comply with Section 404 of the Sarbanes-Oxley Act of 2002, as amended, and the rules and regulations promulgated in connection therewith ("Sarbanes-Oxley Act") as of an earlier date than it would otherwise be required to so comply under applicable law);

(s) Since the date of the latest audited financial statements included in the Pricing Disclosure Package and the Prospectus, there has been no change in the Company's internal control over financial reporting that has materially and adversely affected, or is reasonably likely to materially and adversely affect, the Company's internal control over financial reporting;

(t) The Company maintains disclosure controls and procedures (as such term is defined in Rule 13a-15(e) under the Exchange Act) that comply with the requirements of the Exchange Act applicable to the Company as of the date of this Agreement; such disclosure controls and procedures have been designed to ensure that material information relating to the Company is made known to the Company's principal executive officer and principal financial officer by others within those entities; and such disclosure controls and procedures are effective;

(u) This Agreement has been duly authorized, executed and delivered by the Company;

(v) Neither the Company nor, to the knowledge of the Company, any director, officer, agent, employee, affiliate or other person associated with or acting on behalf of the Company has (i) made, offered, promised or authorized any unlawful contribution, gift, entertainment or other unlawful expense or taken any act in furtherance thereof; (ii) made, offered, promised or authorized any direct or indirect unlawful payment; or (iii) violated or is in violation of any provision of the U.S. Foreign Corrupt Practices Act of 1977, as amended, the Bribery Act 2010 of the United Kingdom or any other applicable anti-bribery or anti-corruption law;

(w) The operations of the Company are and have been conducted at all times in compliance with the requirements of applicable anti-money laundering laws, including, but not limited to, the Bank Secrecy Act of 1970, as amended by the USA PATRIOT ACT of 2001, and the rules and regulations promulgated thereunder, and the anti-money laundering laws of the various jurisdictions in which the Company conducts business (collectively, the "Money Laundering Laws") and no action, suit or proceeding by or before

any court or governmental agency, authority or body or any arbitrator involving the Company with respect to the Money Laundering Laws is pending or, to the knowledge of the Company, threatened;

(x) Neither the Company nor, to the knowledge of the Company, any director, officer, agent, employee or affiliate of the Company is currently the subject or the target of any sanctions administered or enforced by the U.S. Government, including, without limitation, the Office of Foreign Assets Control of the U.S. Department of the Treasury , or the U.S. Department of State and including, without limitation, the designation as a "specially designated national" or "blocked person," the European Union, Her Majesty's Treasury, the United Nations Security Council, or other relevant sanctions authority (collectively, "Sanctions"), nor is the Company located, organized or resident in a country or territory that is the subject or target of Sanctions, and the Company will not directly or indirectly use the proceeds of the offering of the Shares hereunder, or lend, contribute or otherwise make available such proceeds to any subsidiary, joint venture partner or other person or entity (i) to fund or facilitate any activities of or business with any person, or in any country or territory, that, at the time of such funding, is the subject or the target of Sanctions or (ii) in any other manner that will result in a violation by any person (including any person participating in the transaction, whether as underwriter, advisor, investor or otherwise) of Sanctions;

(y) The financial statements, including the notes thereto, included in the Registration Statement, the Pricing Disclosure Package and the Prospectus, together with the related schedules and notes, present fairly in all material respects the financial position of the Company at the dates indicated and the statement of operations, stockholders' equity and cash flows of the Company for the periods specified; said financial statements have been prepared in conformity with GAAP applied on a consistent basis throughout the periods involved. The supporting schedules, if any, included in the Registration Statement, the Pricing Disclosure Package and the Prospectus, present fairly in all material respects and in accordance with GAAP the information required to be stated therein. The selected financial data and the summary financial information included in the Registration Statement, the Pricing Disclosure Package and the Prospectus present fairly in all material respects the information shown therein and have been compiled on a basis consistent with that of the audited financial statements included therein. Except as included therein, no historical or pro forma financial statements or supporting schedules are required to be included in the Registration Statement, the Pricing Disclosure Package or the Prospectus under the Act or the rules and regulations promulgated thereunder;

(z) From the time of initial confidential submission of a registration statement relating to the Shares with the Commission (or, if earlier, the first date on which a Section 5(d) Communication was made) through the date hereof, the Company has been and is an "emerging growth company" as defined in Section 2(a)(19) of the Act (an "Emerging Growth Company");

(aa) There are no persons with registration rights or other similar rights to have any securities registered under the Registration Statement or otherwise registered by the Company under the Act, except as have been validly waived or complied with in connection with the offering of the Shares;

(bb) No material labor disturbance by or dispute with current or former employees or officers of the Company exists or, to the Company's knowledge, is

contemplated or threatened, and the Company is not are aware of any existing or imminent labor disturbance by, or dispute with, the employees of any of the Company's principal suppliers, manufacturers or contractors. The Company is not a party to any collective bargaining agreement.

(cc) Except as set forth in the Pricing Disclosure Package and the Prospectus, the Company has insurance covering its properties, operations, personnel and business, including business interruption insurance, which insurance is in amounts and insures against such losses and risks as are reasonable and is ordinary and customary for comparable companies in the same or similar business; and the Company has (i) not received notice from any insurer or agent of such insurer that capital improvements or other expenditures are required or necessary to be made in order to continue such insurance nor (ii) no reason to believe that it will not be able to renew its existing insurance coverage as and when such coverage expires or to obtain similar coverage at reasonable cost from similar insurers as may be reasonably necessary to continue its business;

(dd) Any studies, tests and preclinical studies and clinical trials conducted by the Company and, to the knowledge of the Company, any studies, tests and preclinical studies and clinical trials conducted on behalf of the Company or in which the Company has participated, were, and if still pending are, being conducted in accordance all applicable laws, including the U.S. Federal Food, Drug and Cosmetic Act and rules and regulations thereunder, except where the failure to be so conducted would not, individually or in the aggregate, reasonably be expected to have a Material Adverse Effect; the Company is not aware of any studies, tests or trials, the results of which the Company believes reasonably and materially call into question the study, test, or trial results described or referred to in the Pricing Disclosure Package and the Prospectus when viewed in the context in which such results are described and the clinical state of development; and, except to the extent disclosed in the Pricing Disclosure Package or the Prospectus, the Company has not received any written notices or correspondence from the FDA or any other comparable federal, state, local or foreign governmental or regulatory authority requiring the termination or suspension of any studies, tests or preclinical studies or clinical trials conducted by or on behalf of the Company;

(ee) Except as would not, individually or in the aggregate, reasonably be expected to have a Material Adverse Effect, the Company is, and at all times since the Company's inception on May 15, 2019 has been, in compliance with all Health Care Laws (defined herein), including, but not limited to, the rules and regulations of the U.S. Department of Health and Human Services Office of Inspector General, the Centers for Medicare & Medicaid Services, the HHS Office for Civil Rights, the U.S. Department of Justice and any other governmental agency or body having jurisdiction over the Company or any of its properties, and has not, since the Company's inception on May 15, 2019, engaged in any activities which are, as applicable, cause for false claims liability, civil penalties, or mandatory or permissive exclusion from Medicare, Medicaid, or any other local, state or federal healthcare program. For purposes of this Agreement, "Health Care Laws" shall mean the U.S. Federal Food, Drug and Cosmetic Act (21 U.S.C. § 301 et seq.); the federal Anti-kickback Statute (42 U.S.C. § 1320a-7b(b)), the Physician Payments Sunshine Act (42 U.S.C. § 1320a-7h), the civil False Claims Act (31 U.S.C. §§ 3729 et seq.), the criminal False Claims Act (42 U.S.C. § 1320a-7b(a)), all criminal laws relating to health care fraud and abuse, including but not limited to 18 U.S.C. §§ 286, 287, and the health care fraud criminal provisions under the Health Insurance Portability and Accountability Act of 1996 (42 U.S.C. §§ 1320d et seq.) ("HIPAA"), the exclusions law (42

U.S.C. § 1320a-7), the civil monetary penalties law (42 U.S.C. § 1320a-7a), Medicare (Title XVIII of the Social Security Act), and Medicaid (Title XIX of the Social Security Act), each as amended, and the regulations promulgated thereunder. The Company and each of its directors, officers, and employees, and to the Company's knowledge, its agents, affiliates and representatives, are not a party to or has any ongoing reporting obligations pursuant to any corporate integrity agreement, deferred prosecution agreement, monitoring agreement, consent decree, settlement order, plan of correction or similar agreement imposed by any governmental authority. The Company and its directors, officers, and employees, and to the Company's knowledge, its agents, affiliates and representatives, have not received any written notification, correspondence or any other written communication, and the Company has not received any oral communication, from any governmental authority of potential or actual non-compliance by, or liability of, the Company under any Health Care Laws;

(ff) The Company possesses, and is in compliance with the terms of, all applications, certificates, approvals, clearances, registrations, exemptions, franchises, licenses, permits, consents and other authorizations necessary to conduct its business (collectively, "Licenses"), issued by the appropriate federal, state, local or foreign governmental or regulatory authorities including, without limitation, from the FDA and equivalent foreign regulatory authorities (collectively, the "Regulatory Agencies"), except where the failure to possess or comply with the same would not, individually or in the aggregate, reasonably be expected to have a Material Adverse Effect. All such Licenses are in full force and effect and the Company is not in material violation of any term or conditions of any such License. The Company has fulfilled and performed all of its material obligations with respect to such Licenses and, to the Company's knowledge, no event has occurred which allows, or after notice or lapse of time would allow, revocation or termination thereof or results in any other impairment of the rights of the holder of any such License. The Company has not received any written, and to the Company's knowledge, oral, notice of proceedings relating to the revocation or material adverse modification of any such Licenses and, to the Company's knowledge, no Regulatory Agency has taken any action to materially limit, suspend or revoke any such License possessed by the Company;

(gg) Neither the Company, nor, to the Company's knowledge, any of its officers, employees, directors, or agents, have been excluded, suspended or debarred from participation in any U.S. federal health care program or, is subject to a governmental inquiry, investigation, proceeding, or other similar action that could reasonably be expected to result in debarment, suspension, or exclusion, or convicted of any crime or engaged in any conduct that would reasonably be expected to result in any suspension, exclusion, or debarment;

(hh) Except as described in the Pricing Disclosure Package, the Company owns or has valid and enforceable licenses or other rights to use all patents and patent applications, copyrights, trademarks, trademark registrations, service marks, service mark registrations, trade names, service names and know-how (including trade secrets and other unpatented and/or unpatentable proprietary or confidential information, inventions, systems or procedures) including the right to sue for past, present and future infringement, misappropriation or dilution of any of the foregoing, to the extent the foregoing are necessary for the conduct of the business of the Company in the manner described in the Pricing Disclosure Package and the Prospectus (collectively, the "Company Intellectual Property"). Other than as disclosed in the Pricing Disclosure Package, there are no rights of third parties to any of the material patents, trademarks and copyrights within the

Company Intellectual Property disclosed in the Pricing Disclosure Package as being owned by the Company, and such intellectual property is owned by the Company free and clear of all material liens, security interests, or encumbrances. To the knowledge of the Company, the material patents, trademarks and copyrights held or licensed by the Company included within the Company's Intellectual Property are valid, enforceable and subsisting. Other than as disclosed in the Pricing Disclosure Package and the Prospectus, (i) the Company is not obligated to pay a material royalty, grant a material license, or provide other material consideration to any third party in connection with the Company Intellectual Property, (ii) no action, suit, claim or other proceeding is pending or, to the knowledge of the Company, is threatened, alleging that the conduct of the business of the Company in the manner described in the Pricing Disclosure Package is infringing, misappropriating, diluting or otherwise violating any intellectual property rights of others, or alleging that such conduct of the Company would, upon the commercialization of any product or service proposed in the Pricing Disclosure Package and the Prospectus to be conducted, infringe, misappropriate, dilute, or otherwise violate, any rights of others with respect to any of the Company's product candidates, processes or intellectual property, and the Company is unaware of any facts which could form a reasonable basis for any such action, suit, proceeding or claim, (iii) no action, suit, claim or other proceeding is pending or, to the knowledge of the Company, is threatened, challenging the validity, enforceability, scope, registration, ownership or use of any of the Company's Intellectual Property, and the Company is not aware of any facts which could form a reasonable basis for any such action, suit, proceeding or claim, (iv) no action, suit, claim or other proceeding is pending or, to the knowledge of the Company, is threatened, challenging the Company's rights in or to any Company Intellectual Property and the Company is unaware of any facts which could form a reasonable basis for any such action, suit, proceeding or claim, (v) to the knowledge of the Company, the development, manufacture, sale, and any currently proposed use of any of the products, proposed products or processes of the Company referred to in the Pricing Disclosure Package and the Prospectus, in the current or proposed conduct of the business of the Company do not currently, and will not upon commercialization, to the knowledge of the Company, infringe any right or valid patent claim of any third party, (vi) to the knowledge of the Company, no employee, consultant or independent contractor of the Company is in violation in any material respect of any term of any employment contract, patent disclosure agreement, invention assignment agreement, non-competition agreement, non-solicitation agreement nondisclosure agreement or any restrictive covenant to or with a former employer or independent contractor where the basis of such violation relates to the ownership by the Company of any Company Intellectual Property, (vii) the Company has taken reasonable measures to protect its material confidential information and material trade secrets and to maintain and safeguard the Company's material Intellectual Property, including the execution of appropriate nondisclosure, confidentiality and invention assignment agreements, and (viii) to the knowledge of the Company, the Company has complied with the material terms of each agreement pursuant to which Company Intellectual Property has been licensed to the Company, and all such agreements are in full force and effect, except in each of (i)-(viii) such as would not, if determined adversely to the Company, individually or in the aggregate, reasonably be expected to have a Material Adverse Effect;

(ii) (i) The Company's information technology assets and equipment, computers, systems, networks, hardware, software, websites, applications, and databases (collectively, "IT Systems") are adequate for, and operate and perform in all material respects as required in connection with the operation of the business of the Company as currently conducted, free and clear of all material bugs, errors, defects, Trojan horses, time

bombs, malware and other corruptants; (ii) the Company has implemented and maintained commercially reasonable controls, policies, procedures, and safeguards to maintain and protect its material confidential information and the integrity, continuous operation, redundancy and security of all IT Systems and data (including all personal, personally identifiable, sensitive, confidential or regulated data ("Personal Data")) used in connection with its business, and to the Company's knowledge, there have been no material breaches, violations, outages or unauthorized uses of or accesses to same, except for those that have been remedied without material cost or liability or the duty to notify any other person, nor any incidents under internal review or investigations relating to the same; and (iii) the Company is presently in material compliance with all applicable laws or statutes and all judgments, orders, rules and regulations of any court or arbitrator or governmental or regulatory authority, internal policies and contractual obligations relating to the privacy and security of IT Systems and Personal Data and to the protection of such IT Systems and Personal Data from unauthorized use, access, misappropriation or modification;

(jj) Except as would not, individually or in the aggregate, reasonably be expected to have a Material Adverse Effect, all patents and patent applications within the Company Intellectual Property disclosed in the Pricing Disclosure Package as owned by or licensed to the Company have, to the knowledge of the Company, been duly and properly filed and maintained; to the knowledge of the Company, there are no material defects in such patents; to the knowledge of the Company, the parties prosecuting such applications have materially complied with their duty of candor and disclosure to the U.S. Patent and Trademark Office ("USPTO") in connection with such applications; and the Company is not aware of any facts required to be disclosed to the USPTO that were not disclosed to the USPTO and which would preclude the grant of a patent in connection with any such application or could form the basis of a finding of invalidity with respect to any patents that have issued with respect to such applications;

(kk) Any statistical, industry-related and market-related data included in the Pricing Disclosure Package and the Prospectus are based on or derived from sources that the Company believes, after reasonable inquiry, to be reliable and accurate in all material respects and, to the extent required by such sources, the Company has obtained the written consent to the use of such data from such sources;

(ll) There are no off-balance sheet arrangements (as defined in Item 303(a)(4)(ii) of Regulation S-K of the Act) that may have a material current or future effect on the Company's financial condition, changes in financial condition, results of operations, liquidity, capital expenditures or capital resources;

(mm) The Company has not sold or issued any securities during the six-month period preceding the date of the Prospectus, including any sales pursuant to Rule 144A or Regulation D of the Act, other than (i) shares issued pursuant to employee benefit plans disclosed in the Pricing Disclosure Package and the Prospectus, stock option plans or other employee compensation plans or pursuant to outstanding options, rights or warrants, or (ii) as disclosed in the Pricing Disclosure Package and the Prospectus;

(nn) All United States federal income tax returns of the Company required by law to be filed have been filed and all taxes shown as due on such returns or that otherwise have been assessed, which are due and payable, have been paid, except assessments against which appeals have been or will be promptly taken and as to which adequate reserves have been provided. The Company has filed all other tax returns that are required

to have been filed by them pursuant to applicable foreign, state, local or other law except insofar as the failure to file such returns would not, individually or in the aggregate, reasonably be expected to have a Material Adverse Effect, and has paid all material taxes due pursuant to such returns or pursuant to any assessment received by the Company, except for such taxes, if any, as are being contested in good faith and as to which adequate reserves have been provided. The charges, accruals and reserves on the books of the Company in respect of any income and corporation tax liability for any years not finally determined are adequate to meet any assessments or re-assessments for additional income tax for any years not finally determined, except to the extent of any inadequacy that would not, individually or in the aggregate, reasonably be expected to have a Material Adverse Effect. No tax deficiency has been determined adversely to the Company which has had (nor does the Company have any written notice or knowledge of any tax deficiency which could reasonably be expected to be determined adversely to the Company and which would, individually or in the aggregate, reasonably be expected to have a Material Adverse Effect;

(oo) The Company has not taken and will not take, directly or indirectly, without giving effect to activities by the Underwriters, any action that is designed to or that has constituted or might reasonably be expected to cause or result in stabilization or manipulation of the price of the Shares;

(pp) The Company is not a party to any contract, agreement or understanding with any person (other than this Agreement) that would give rise to a valid claim against the Company or any Underwriter for a brokerage commission, finder's fee or like payment in connection with the offering and sale of the Shares;

(qq) No relationship, direct or indirect, exists between or among the Company, on the one hand, and the directors, officers, stockholders, customers or suppliers of the Company, on the other, that is required by the Act to be described in the Pricing Disclosure Package and the Prospectus and that is not so described in such documents and in the Pricing Disclosure Package and the Prospectus;

(rr) Solely to the extent that the Sarbanes-Oxley Act has been applicable to the Company, the Company has taken all necessary actions to ensure that it is in compliance with all provisions of the Sarbanes-Oxley Act with which the Company is required to comply as of the Applicable Time, and the Company currently plans to take reasonable steps to ensure that it will be in compliance with other provisions of the Sarbanes-Oxley Act not currently in effect, upon the effectiveness of such provisions, or which will become applicable to the Company at all times after the effectiveness of the Registration Statement;

(ss) The Company does not have any debt securities or preferred stock that are rated by any "nationally recognized statistical rating agency" (as defined in Section 3(a)(62) of the Exchange Act);

(tt) The Registration Statement, the Pricing Disclosure Package and the Prospectus, any Preliminary Prospectus and any Issuer Free Writing Prospectuses comply in all material respects, and any further amendments or supplements thereto will comply in all material respects, with any applicable laws or regulations of foreign jurisdictions in which the Pricing Disclosure Package, the Prospectus, any Preliminary Prospectus and any Issuer Free Writing Prospectus, as amended or supplemented, if applicable, are distributed in connection with the Directed Share Program;

(uu) No authorization, approval, consent, license, order, registration or qualification of or with any government, governmental instrumentality or court, other than such as have been obtained, is necessary under the securities laws and regulations of foreign jurisdictions in which the Directed Shares are offered outside the United States;

(vv) The Company has specifically directed in writing the allocation of Shares to each Participant in the Directed Share Program, and neither the Directed Share Underwriter nor any other Underwriter has had any involvement or influence, directly or indirectly, in such allocation decision; and

(ww) The Company has not offered, or caused the Directed Share Underwriter or such Directed Share Underwriter's affiliates to offer, Shares to any person pursuant to the Directed Share Program (i) for any consideration other than the cash payment of the initial public offering price per share set forth in Schedule II hereof or (ii) with the specific intent to unlawfully influence (x) a customer or supplier of the Company to alter the customer or supplier's terms, level or type of business with the Company or (y) a trade journalist or publication to write or publish favorable information about the Company or its products.

2. Subject to the terms and conditions herein set forth, (a) the Company agrees to issue and sell to each of the Underwriters, and each of the Underwriters agrees, severally and not jointly, to purchase from the Company, at a purchase price per share of $[●], the number of Firm Shares set forth opposite the name of such Underwriter in Schedule I hereto and (b) in the event and to the extent that the Underwriters shall exercise the election to purchase Optional Shares as provided below, the Company agrees to issue and sell to each of the Underwriters, and each of the Underwriters agrees, severally and not jointly, to purchase from the Company, at the purchase price per share set forth in clause (a) of this Section 2 (provided that the purchase price per Optional Share shall be reduced by an amount per share equal to any dividends or distributions declared by the Company and payable on the Firm Shares but not payable on the Optional Shares), that portion of the number of Optional Shares as to which such election shall have been exercised (to be adjusted by you so as to eliminate fractional shares) determined by multiplying such number of Optional Shares by a fraction, the numerator of which is the maximum number of Optional Shares which such Underwriter is entitled to purchase as set forth opposite the name of such Underwriter in Schedule I hereto and the denominator of which is the maximum number of Optional Shares that all of the Underwriters are entitled to purchase hereunder.

The Company hereby grants to the Underwriters the right to purchase at their election up to [●] Optional Shares, at the purchase price per share set forth in the paragraph above, for the sole purpose of covering sales of shares in excess of the number of Firm Shares, provided that the purchase price per Optional Share shall be reduced by an amount per share equal to any dividends or distributions declared by the Company and payable on the Firm Shares but not payable on the Optional Shares. Any such election to purchase Optional Shares may be exercised only by written notice from the Representatives to the Company, given within a period of 30 calendar days after the date of this Agreement, setting forth the aggregate number of Optional Shares to be purchased and the date on which such Optional Shares are to be delivered, as determined by the Representatives but in no event earlier than the First Time of Delivery (as defined in Section 4 hereof) or, unless the Representatives and the Company otherwise agree in writing, earlier than two or later than ten business days after the date of such notice.

3. Upon the authorization by you of the release of the Firm Shares, the several Underwriters propose to offer the Firm Shares for sale upon the terms and conditions set forth in the Pricing Disclosure Package and the Prospectus.

4. (a) The Shares to be purchased by each Underwriter hereunder, in book-entry form, and in such authorized denominations and registered in such names as the Representatives may request upon at least forty-eight hours' prior notice to the Company shall be delivered by or on behalf of the Company to the Representatives, through the facilities of the Depository Trust Company ("DTC"), for the account of such Underwriter, against payment by or on behalf of such Underwriter of the purchase price therefor by wire transfer of Federal (same-day) funds to the account specified by the Company to the Representatives at least forty-eight hours in advance. The time and date of such delivery and payment shall be, with respect to the Firm Shares, 9:30 a.m., New York City time, on [●], 2019 or such other time and date as the Representatives and the Company may agree upon in writing, and, with respect to the Optional Shares, 9:30 a.m., New York time, on the date specified by the Representatives in the written notice given by the Representatives of the Underwriters' election to purchase such Optional Shares, or such other time and date as the Representatives and the Company may agree upon in writing. Such time and date for delivery of the Firm Shares is herein called the "First Time of Delivery", such time and date for delivery of the Optional Shares, if not the First Time of Delivery, is herein called the "Second Time of Delivery", and each such time and date for delivery is herein called a "Time of Delivery".

(b) The documents to be delivered at each Time of Delivery by or on behalf of the parties hereto pursuant to Section 8 hereof, including the cross receipt for the Shares and any additional documents requested by the Underwriters pursuant to Section 8(i) hereof, will be delivered at the offices of Cooley LLP, 4401 Eastgate Mall, San Diego, California 92121 (the "Closing Location"), and the Shares will be delivered, all at such Time of Delivery. A meeting will be held at the Closing Location at [●] p.m., New York City time, on the New York Business Day next preceding such Time of Delivery, at which meeting the final drafts of the documents to be delivered pursuant to the preceding sentence will be available for review by the parties hereto. For the purposes of this Section 4, "New York Business Day" shall mean each Monday, Tuesday, Wednesday, Thursday and Friday which is not a day on which banking institutions in New York City are generally authorized or obligated by law or executive order to close.

5. The Company agrees with each of the Underwriters:

(a) To prepare the Prospectus in a form approved by you and to file such Prospectus pursuant to Rule 424(b) under the Act not later than the Commission's close of business on the second business day following the execution and delivery of this Agreement, or, if applicable, such earlier time as may be required by Rule 430A(a)(3) under the Act; to make no further amendment or any supplement to the Registration Statement or the Prospectus prior to the last Time of Delivery which shall be disapproved by you promptly after reasonable notice thereof; to advise you, promptly after it receives notice thereof, of the time when any amendment to the Registration Statement has been filed or becomes effective or any amendment or supplement to the Prospectus has been filed and to furnish you with copies thereof; to file promptly all material required to be filed by the Company with the Commission pursuant to Rule 433(d) under the Act; to advise you, promptly after it receives notice thereof, of the issuance by the Commission of any stop order or of any order preventing or suspending the use of any Preliminary Prospectus or

other prospectus in respect of the Shares, of the suspension of the qualification of the Shares for offering or sale in any jurisdiction, of the initiation or threatening of any proceeding for any such purpose, or of any request by the Commission for the amending or supplementing of the Registration Statement or the Prospectus or for additional information; and, in the event of the issuance of any stop order or of any order preventing or suspending the use of any Preliminary Prospectus or other prospectus or suspending any such qualification, to promptly use its best efforts to obtain the withdrawal of such order;

(b) Promptly from time to time to take such action as you may reasonably request to qualify the Shares for offering and sale under the securities laws of such jurisdictions as you may request and to comply with such laws so as to permit the continuance of sales and dealings therein in such jurisdictions for as long as may be necessary to complete the distribution of the Shares, provided that in connection therewith the Company shall not be required to qualify as a foreign corporation (where not otherwise required) or to file a general consent to service of process in any jurisdiction (where not otherwise required);

(c) Prior to 10:00 a.m., New York City time, on the New York Business Day next succeeding the date of this Agreement (or such other time as may be agreed to by the Representatives and the Company) and from time to time, to furnish the Underwriters with written and electronic copies of the Prospectus in New York City in such quantities as you may reasonably request, and, if the delivery of a prospectus (or in lieu thereof, the notice referred to in Rule 173(a) under the Act) is required at any time prior to the expiration of nine months after the time of issue of the Prospectus in connection with the offering or sale of the Shares and if at such time any event shall have occurred as a result of which the Prospectus as then amended or supplemented would include an untrue statement of a material fact or omit to state any material fact necessary in order to make the statements therein, in the light of the circumstances under which they were made when such Prospectus (or in lieu thereof, the notice referred to in Rule 173(a) under the Act) is delivered, not misleading, or, if for any other reason it shall be necessary during such same period to amend or supplement the Prospectus in order to comply with the Act, to notify you and upon your request to prepare and furnish without charge to each Underwriter and to any dealer in securities as many written and electronic copies as you may from time to time reasonably request of an amended Prospectus or a supplement to the Prospectus which will correct such statement or omission or effect such compliance; and in case any Underwriter is required to deliver a prospectus (or in lieu thereof, the notice referred to in Rule 173(a) under the Act) in connection with sales of any of the Shares at any time nine months or more after the time of issue of the Prospectus, upon your request but at the expense of such Underwriter, to prepare and deliver to such Underwriter as many written and electronic copies as you may request of an amended or supplemented Prospectus complying with Section 10(a)(3) of the Act;

(d) To make generally available to its securityholders as soon as practicable (which may be satisfied by filing with the Commission’s Electronic Data Gathering Analysis and Retrieval System (“EDGAR”)), but in any event not later than sixteen months after the effective date of the Registration Statement (as defined in Rule 158(c) under the Act), an earnings statement of the Company (which need not be audited) complying with Section 11(a) of the Act and the rules and regulations of the Commission thereunder (including, at the option of the Company, Rule 158);

(e) (i) During the period beginning from the date hereof and continuing to and including the date 180 days after the date of the Prospectus (the "Lock-Up Period"), not to (1) offer, sell, contract to sell, pledge, grant any option to purchase, make any short sale or otherwise transfer or dispose of, directly or indirectly, or file with or confidentially submit to the Commission a registration statement under the Act relating to, any securities of the Company that are substantially similar to the Shares, including but not limited to any options or warrants to purchase shares of Stock or any securities that are convertible into or exchangeable for, or that represent the right to receive, Stock or any such substantially similar securities, (2) enter into any swap or other agreement that transfers, in whole or in part, any of the economic consequences of ownership of the Stock or any such other securities, whether any such transaction described in clauses (1) or (2) above is to be settled by delivery of Stock or such other securities, in cash or otherwise or (3) publicly disclose the intention to do any of the foregoing, in each case, without the prior written consent of the Representatives; provided, however, that the foregoing restrictions shall not apply to: (A) the Shares to be sold hereunder, (B) any shares of Stock or any securities or other awards convertible into, exercisable for, or that represent the right to receive, shares of Stock pursuant to any stock option plan, incentive plan or stock purchase plan of the Company (collectively, "Company Stock Plans") or otherwise in equity compensation arrangements described in the Registration Statement, the Pricing Disclosure Package and the Prospectus, (C) any shares of Stock issued upon the conversion, exercise or exchange of convertible, exercisable or exchangeable securities outstanding on the date of this Agreement and described in the Registration Statement, the Pricing Disclosure Package and the Prospectus, (D) the filing by the Company of any registration statement on Form S-8 or a successor form thereto relating to any Company Stock Plan described in the Registration Statement, the Pricing Disclosure Package and the Prospectus, and (E) any shares of Stock or any securities convertible into or exchangeable for, or that represent the right to receive, shares of Stock issued in connection with any bona fide licensing, commercialization, joint venture, technology transfer or development collaboration agreement with an unaffiliated third party, provided that in the case of clause (E), the aggregate number of shares that the Company may sell or issue or agree to sell or issue pursuant to clause (E) shall not exceed 5.0% of the total number of shares of Stock issued and outstanding immediately following the completion of the transactions contemplated by this Agreement, and provided, further, that the Company shall cause each recipient of such securities pursuant to clauses (B), (C) and (E) during the Lock-Up Period to execute and deliver to the Representatives, on or prior to the issuance of such securities, a lock-up letter in substantially the form attached as Annex II hereto for the remainder of the Lock-Up Period (as defined therein) and enter stop transfer instructions with the Company's transfer agent and registrar on such securities, which the Company agrees it will not waive or amend without the prior written consent of the Representatives.

(ii) If the Representatives, in their sole discretion, agree to release or waive the restrictions set forth in a lock-up letter described in Section 8(i) hereof for an officer or director of the Company and provide the Company with notice of the impending release or waiver at least three business days before the effective date of the release or waiver, the Company agrees to announce the impending release or waiver by a press release substantially in the form of Annex I hereto through a major news service at least two business days before the effective date of the release or waiver.

(iii) To enforce all existing agreements between the Company and any of its securityholders that prohibit the sale, transfer, assignment, pledge or hypothecation of any of the Company's securities in connection with the Company's initial public offering

until, in respect of any particular securityholder, the earlier to occur of (i) the expiration of the Lock-Up Period or (ii) the expiration of any similar arrangement entered into by such securityholder with the Representatives; to direct the transfer agent to place stop transfer restrictions upon any such securities of the Company that are bound by such existing "lock-up," "market stand-off," "holdback" or similar provisions of such agreements for the duration of the periods contemplated in the preceding clause; and not to release or otherwise grant any waiver of such provisions in such agreements during such periods without the prior written consent of the Representatives, on behalf of the Underwriters;

(f) During the period of three years from the effective date of the Registration Statement, so long as the Company is subject to the reporting requirements of either Section 13 or Section 15(d) of the Exchange Act, to furnish to its stockholders as soon as practicable after the end of each fiscal year an annual report (including a balance sheet and statements of income, stockholders' equity and cash flows of the Company certified by independent public accountants) and, as soon as practicable after the end of each of the first three quarters of each fiscal year (beginning with the fiscal quarter ending after the effective date of the Registration Statement), to make available to its stockholders consolidated summary financial information of the Company for such quarter in reasonable detail; provided, that no reports, documents or other information needs to be furnished pursuant to this Section 5(f) to the extent they are available on EDGAR;

(g) During a period of three years from the effective date of the Registration Statement, to furnish to you copies of all reports or other communications (financial or other) furnished to stockholders, and to deliver to you (i) as soon as they are available, copies of any reports and financial statements furnished to or filed with the Commission or any national securities exchange on which any class of securities of the Company is listed; and (ii) such additional information concerning the business and financial condition of the Company as you may from time to time reasonably request (such financial statements to be on a consolidated basis to the extent the accounts of the Company are consolidated in reports furnished to its stockholders generally or to the Commission); provided, that no reports or documents or other information needs to be furnished pursuant to this Section 5(g) to the extent they are available on EDGAR;

(h) To use the net proceeds received by it from the sale of the Shares pursuant to this Agreement in the manner specified in the Pricing Disclosure Package and the Prospectus under the caption "Use of Proceeds";

(i) To use its best efforts to list for quotation the Shares on the Nasdaq Global Market ("Nasdaq");

(j) To file with the Commission such information on Form 10-Q or Form 10-K as may be required by Rule 463 under the Act;

(k) If the Company elects to rely upon Rule 462(b), the Company shall file a Rule 462(b) Registration Statement with the Commission in compliance with Rule 462(b) by 10:00 p.m., Washington, D.C. time, on the date of this Agreement, and the Company shall at the time of filing either pay to the Commission the filing fee for the Rule 462(b) Registration Statement or give irrevocable instructions for the payment of such fee pursuant to Rule 111(b) under the Act;

(l) Upon request of any Underwriter, to furnish, or cause to be furnished, to such Underwriter an electronic version of the Company's trademarks, servicemarks and corporate logo for use on the website, if any, operated by such Underwriter for the purpose of facilitating the on-line offering of the Shares (the "License"); provided, however, that the License shall be used solely for the purpose described above, is granted without any fee and may not be assigned or transferred;

(m) To comply with all applicable securities and other laws, rules and regulations in each jurisdiction in which the Directed Shares are offered in connection with the Directed Share Program; and

(n) To promptly notify you if the Company ceases to be an Emerging Growth Company at any time prior to the later of (i) completion of the distribution of the Shares within the meaning of the Act and (ii) the last Time of Delivery.

6. (a) The Company represents and agrees that, without the prior consent of the Representatives, it has not made and will not make any offer relating to the Shares that would constitute a "free writing prospectus" as defined in Rule 405 under the Act; each Underwriter represents and agrees that, without the prior consent of the Company and the Representatives, it has not made and will not make any offer relating to the Shares that would constitute a free writing prospectus required to be filed with the Commission; any such free writing prospectus the use of which has been consented to by the Company and the Representatives is listed on Schedule II(a) hereto;

(b) The Company has complied and will comply with the requirements of Rule 433 under the Act applicable to any Issuer Free Writing Prospectus, including timely filing with the Commission or retention where required and legending; and the Company represents that it has satisfied and agrees that it will satisfy the conditions under Rule 433 under the Act to avoid a requirement to file with the Commission any electronic road show;

(c) The Company agrees that if at any time following issuance of an Issuer Free Writing Prospectus or any Section 5(d) Writing prepared or authorized by it any event occurred or occurs as a result of which such Issuer Free Writing Prospectus or Section 5(d) Writing prepared by or authorized by it would conflict with the information in the Registration Statement, the Pricing Disclosure Package or the Prospectus or would include an untrue statement of a material fact or omit to state any material fact necessary in order to make the statements therein, in the light of the circumstances then prevailing, not misleading, the Company will give prompt notice thereof to the Representatives and, if requested by the Representatives, will prepare and furnish without charge to each Underwriter an Issuer Free Writing Prospectus, Section 5(d) Writing or other document which will correct such conflict, statement or omission; provided, however, that this representation and warranty shall not apply to any statements or omissions in an Issuer Free Writing Prospectus or Section 5(d) Writing prepared or authorized by it made in reliance upon and in conformity with the Underwriter Information;

(d) The Company represents and agrees that (i) it has not engaged in, or authorized any other person to engage in, any Section 5(d) Communications, other than Section 5(d) Communications with the prior consent of the Representatives with entities that are qualified institutional buyers as defined in Rule 144A under the Act or institutions that are accredited investors as defined in Rule 501(a) under the Act; and (ii) it has not distributed, or authorized any other person to distribute, any Section 5(d) Writings, other

than those distributed with the prior consent of the Representatives that are listed on Schedule II(d) hereto; and the Company reconfirms that the Underwriters have been authorized to act on its behalf in engaging in Section 5(d) Communications; and

(e) Each Underwriter represents and agrees that any Section 5(d) Communications undertaken by it were with entities that are qualified institutional buyers as defined in Rule 144A under the Act or institutions that are accredited investors as defined in Rule 501(a) under the Act;

7. The Company covenants and agrees with the several Underwriters that the Company will pay or cause to be paid the following: (i) the fees, disbursements and expenses of the Company's counsel and accountants in connection with the registration of the Shares under the Act and all other expenses in connection with the preparation, printing, reproduction and filing of the Registration Statement, any Preliminary Prospectus, any Section 5(d) Writing, any Issuer Free Writing Prospectus and the Prospectus and amendments and supplements thereto and the mailing and delivering of copies thereof to the Underwriters and dealers; (ii) the cost of printing or producing any Agreement among Underwriters, this Agreement, the Blue Sky Memorandum, closing documents (including any compilations thereof) and any other documents in connection with the offering, purchase, sale and delivery of the Shares; (iii) all expenses in connection with the qualification of the Shares for offering and sale under state securities laws as provided in Section 5(b) hereof, including the fees and disbursements of counsel for the Underwriters in connection with such qualification and in connection with the Blue Sky survey; (iv) all fees and expenses in connection with listing the Shares on Nasdaq; (v) the filing fees incident to, and the fees and disbursements of counsel for the Underwriters in connection with, any required review by FINRA of the terms of the sale of the Shares; (vi) the cost of preparing stock certificates; (vii) the cost and charges of any transfer agent or registrar; (viii) all fees and disbursements of counsel incurred by the Underwriters in connection with the Directed Share Program and stamp duties, similar taxes or duties or other taxes, if any, incurred by the Underwriters in connection with the Directed Share Program; and (ix) all other costs and expenses incident to the performance of its obligations hereunder which are not otherwise specifically provided for in this Section; provided, however, that the amounts payable by the Company pursuant to clauses (iii) and (v) for the fees and disbursements of counsel to the Underwriters described in clauses (iii) and (v) shall not exceed $40,000 in the aggregate. It is understood, however, that, except as provided in this Section, and Sections 9, 10 and 13 hereof, the Underwriters will pay all of their own costs and expenses, including the fees of their counsel, stock transfer taxes on resale of any of the Shares by them, and any advertising expenses connected with any offers they may make and all travel and lodging expenses of the Underwriters and their representatives and counsel; provided, however, that, the cost of any aircraft chartered in connection with any roadshow shall be paid 50% by the Company and 50% by the Underwriters.

8. The obligations of the Underwriters hereunder, as to the Shares to be delivered at each Time of Delivery, shall be subject, in their discretion, to the condition that all representations and warranties and other statements of the Company herein are, at and as of the Applicable Time and such Time of Delivery, true and correct, the condition that the Company shall have performed all of its obligations hereunder theretofore to be performed, and the following additional conditions:

(a) The Prospectus shall have been filed with the Commission pursuant to Rule 424(b) under the Act within the applicable time period prescribed for such filing by the rules

and regulations under the Act and in accordance with Section 5(a) hereof; all material required to be filed by the Company pursuant to Rule 433(d) under the Act shall have been filed with the Commission within the applicable time period prescribed for such filing by Rule 433; if the Company has elected to rely upon Rule 462(b) under the Act, the Rule 462(b) Registration Statement shall have become effective by 10:00 p.m., Washington, D.C. time, on the date of this Agreement; no stop order suspending the effectiveness of the Registration Statement or any part thereof shall have been issued and no proceeding for that purpose shall have been initiated or threatened by the Commission; no stop order suspending or preventing the use of the Pricing Disclosure Package, Prospectus or any Issuer Free Writing Prospectus shall have been initiated or threatened by the Commission; and all requests for additional information on the part of the Commission shall have been complied with to your reasonable satisfaction;

(b) Cooley LLP, counsel for the Underwriters, shall have furnished to you such written opinion or opinions, dated such Time of Delivery, in form and substance satisfactory to the Representatives, with respect to such matters as the Representatives may reasonably request, and such counsel shall have received such papers and information as they may reasonably request to enable them to pass upon such matters;

(c) Latham & Watkins LLP, counsel for the Company, shall have furnished to the Representatives their written opinion and negative assurance letter, dated such Time of Delivery, in form and substance satisfactory to the Representatives;

(d) Wilson Sonsini Goodrich & Rosati, intellectual property counsel for the Company, shall have furnished to the Representatives their written opinion with respect to certain intellectual property matters, dated such Time of Delivery, in form and substance satisfactory to the Representatives;

(e) On the date of the Prospectus at a time prior to the execution of this Agreement, at 9:30 a.m., New York City time, on the effective date of any post-effective amendment to the Registration Statement filed subsequent to the date of this Agreement and also at each Time of Delivery, Ernst & Young LLP shall have furnished to the Representatives a letter or letters, dated the respective dates of delivery thereof, in form and substance satisfactory to the Representatives;

(f) (i) The Company shall not have sustained since the date of the latest audited financial statements included in the Pricing Disclosure Package and the Prospectus any loss or interference with its business from fire, explosion, flood or other calamity, whether or not covered by insurance, or from any labor dispute or court or governmental action, order or decree, otherwise than as set forth or contemplated in the Pricing Disclosure Package and the Prospectus, and (ii) since the respective dates as of which information is given in the Pricing Disclosure Package and the Prospectus there shall not have been any change in the capital stock (other than as a result of the exercise of stock options or the award of stock options or restricted stock in the ordinary course of business pursuant to the Company's equity plans that are described in the Pricing Disclosure Package) or long-term debt of the Company or any change or effect, or any development involving a prospective change or effect, in or affecting (x) the business, properties, general affairs, management, financial position, stockholders' equity or results of operations of the Company, except as set forth or contemplated in the Pricing Disclosure Package and the Prospectus, or (y) the ability of the Company to perform its obligations under this Agreement, including the issuance and sale of the Shares, or to consummate the

transactions contemplated in the Pricing Disclosure Package and the Prospectus, the effect of which, in any such case described in clause (i) or (ii), is in your judgment so material and adverse as to make it impracticable or inadvisable to proceed with the public offering or the delivery of the Shares being delivered at such Time of Delivery on the terms and in the manner contemplated in the Pricing Disclosure Package and the Prospectus;

(g) On or after the Applicable Time there shall not have occurred any of the following: (i) a suspension or material limitation in trading in securities generally on the New York Stock Exchange or on Nasdaq; (ii) a suspension or material limitation in trading in the Company's securities on Nasdaq; (iii) a general moratorium on commercial banking activities declared by either Federal, California State or New York State authorities or a material disruption in commercial banking or securities settlement or clearance services in the United States; (iv) the outbreak or escalation of hostilities involving the United States or the declaration by the United States of a national emergency or war; or (v) the occurrence of any other calamity or crisis or any change in financial, political or economic conditions in the United States or elsewhere, if the effect of any such event specified in clause (iv) or (v) in your judgment makes it impracticable or inadvisable to proceed with the public offering or the delivery of the Shares being delivered at such Time of Delivery on the terms and in the manner contemplated in the Pricing Disclosure Package and the Prospectus;

(h) The Shares to be sold at such Time of Delivery shall have been duly listed for quotation on Nasdaq;

(i) The Company shall have obtained and delivered to the Underwriters executed copies of an agreement from each director, officer and other security holder of the Company representing all of the shares of capital stock of the Company, substantially to the effect set forth in Annex II hereof in form and substance satisfactory to the Representatives;

(j) The Company shall have delivered to the Representatives on the date of the Prospectus at a time prior to the execution of this Agreement and at such Time of Delivery a certificate of the Chief Financial Officer of the Company, in form and substance satisfactory to the Representatives;

(k) The Company shall have complied with the provisions of Section 5(c) hereof with respect to the furnishing of prospectuses on the New York Business Day next succeeding the date of this Agreement (or such other time as may be agreed to by the Representatives and the Company); and

(l) The Company shall have furnished or caused to be furnished to you at such Time of Delivery certificates of officers of the Company satisfactory to you as to the accuracy of the representations and warranties of the Company herein at and as of such Time of Delivery, as to the performance by the Company of all of its obligations hereunder to be performed at or prior to such Time of Delivery, as to the matters set forth in subsections (a) and (e) of this Section and as to such other matters as you may reasonably request.

9. (a) The Company will indemnify and hold harmless each Underwriter against any losses, claims, damages or liabilities, joint or several, to which such Underwriter may become subject, under the Act or otherwise, insofar as such losses,

claims, damages or liabilities (or actions in respect thereof) arise out of or are based upon an untrue statement or alleged untrue statement of a material fact contained in the Registration Statement, any Preliminary Prospectus, the Pricing Disclosure Package or the Prospectus, or any amendment or supplement thereto, any Issuer Free Writing Prospectus, any "roadshow" as defined in Rule 433(h) under the Act (a "roadshow"), or any "issuer information" filed or required to be filed pursuant to Rule 433(d) under the Act, or any Section 5(d) Writing, or arise out of or are based upon the omission or alleged omission to state therein a material fact required to be stated therein or necessary to make the statements therein not misleading, and will reimburse each Underwriter for any legal or other expenses reasonably incurred by such Underwriter in connection with investigating or defending any such action or claim as such expenses are incurred; *provided*, *however*, that the Company shall not be liable in any such case to the extent that any such loss, claim, damage or liability arises out of or is based upon an untrue statement or alleged untrue statement or omission or alleged omission made in the Registration Statement, any Preliminary Prospectus, the Pricing Disclosure Package or the Prospectus, or any amendment or supplement thereto, or any Issuer Free Writing Prospectus, or any Section 5(d) Writing, in reliance upon and in conformity with the Underwriter Information.

(b) Each Underwriter will indemnify and hold harmless the Company against any losses, claims, damages or liabilities to which the Company may become subject, under the Act or otherwise, insofar as such losses, claims, damages or liabilities (or actions in respect thereof) arise out of or are based upon an untrue statement or alleged untrue statement of a material fact contained in the Registration Statement, any Preliminary Prospectus, the Pricing Disclosure Package or the Prospectus, or any amendment or supplement thereto, or any Issuer Free Writing Prospectus, or any roadshow or any Section 5(d) Writing, or arise out of or are based upon the omission or alleged omission to state therein a material fact required to be stated therein or necessary to make the statements therein not misleading, in each case to the extent, but only to the extent, that such untrue statement or alleged untrue statement or omission or alleged omission was made in the Registration Statement, any Preliminary Prospectus, the Pricing Disclosure Package or the Prospectus, or any amendment or supplement thereto, or any Issuer Free Writing Prospectus, or any roadshow or any Section 5(d) Writing, in reliance upon and in conformity with the Underwriter Information; and will reimburse the Company for any legal or other expenses reasonably incurred by the Company in connection with investigating or defending any such action or claim as such expenses are incurred. As used in this Agreement with respect to an Underwriter and an applicable document, "Underwriter Information" shall mean the written information furnished to the Company by such Underwriter through the Representatives expressly for use therein; it being understood and agreed upon that the only such information furnished by any Underwriter consists of the following information in the Prospectus furnished on behalf of each Underwriter: the concession and reallowance figures appearing in the fifth paragraph under the caption "Underwriting", and the information contained in the ninth, tenth and eleventh paragraphs under the caption "Underwriting".

(c) Promptly after receipt by an indemnified party under subsection (a) or (b) of this Section 9 of notice of the commencement of any action, such indemnified party shall, if a claim in respect thereof is to be made against the indemnifying party under such subsection, notify the indemnifying party in writing of the commencement thereof; provided that the failure to notify the indemnifying party shall not relieve it from any liability that it may have under the preceding paragraphs of this Section 9 except to the extent that it has been materially prejudiced (through the forfeiture of substantive rights or defenses) by such

failure; and provided further that the failure to notify the indemnifying party shall not relieve it from any liability that it may have to an indemnified party otherwise than under the preceding paragraphs of this Section 9. In case any such action shall be brought against any indemnified party and it shall notify the indemnifying party of the commencement thereof, the indemnifying party shall be entitled to participate therein and, to the extent that it shall wish, jointly with any other indemnifying party similarly notified, to assume the defense thereof, with counsel satisfactory to such indemnified party (who shall not, except with the consent of the indemnified party, be counsel to the indemnifying party), and, after notice from the indemnifying party to such indemnified party of its election so to assume the defense thereof, the indemnifying party shall not be liable to such indemnified party under such subsection for any legal expenses of other counsel or any other expenses, in each case subsequently incurred by such indemnified party, in connection with the defense thereof other than reasonable costs of investigation. No indemnifying party shall, without the written consent of the indemnified party, effect the settlement or compromise of, or consent to the entry of any judgment with respect to, any pending or threatened action or claim in respect of which indemnification or contribution may be sought hereunder (whether or not the indemnified party is an actual or potential party to such action or claim) unless such settlement, compromise or judgment (i) includes an unconditional release of the indemnified party from all liability arising out of such action or claim and (ii) does not include a statement as to or an admission of fault, culpability or a failure to act, by or on behalf of any indemnified party.

(d) If the indemnification provided for in this Section 9 is unavailable to or insufficient to hold harmless an indemnified party under subsection (a) or (b) above in respect of any losses, claims, damages or liabilities (or actions in respect thereof) referred to therein, then each indemnifying party shall contribute to the amount paid or payable by such indemnified party as a result of such losses, claims, damages or liabilities (or actions in respect thereof) in such proportion as is appropriate to reflect the relative benefits received by the Company on the one hand and the Underwriters on the other from the offering of the Shares. If, however, the allocation provided by the immediately preceding sentence is not permitted by applicable law, then each indemnifying party shall contribute to such amount paid or payable by such indemnified party in such proportion as is appropriate to reflect not only such relative benefits but also the relative fault of the Company on the one hand and the Underwriters on the other in connection with the statements or omissions which resulted in such losses, claims, damages or liabilities (or actions in respect thereof), as well as any other relevant equitable considerations. The relative benefits received by the Company on the one hand and the Underwriters on the other shall be deemed to be in the same proportion as the total net proceeds from the offering (before deducting expenses) received by the Company bear to the total underwriting discounts and commissions received by the Underwriters, in each case as set forth in the table on the cover page of the Prospectus. The relative fault shall be determined by reference to, among other things, whether the untrue or alleged untrue statement of a material fact or the omission or alleged omission to state a material fact relates to information supplied by the Company on the one hand or the Underwriters on the other and the parties' relative intent, knowledge, access to information and opportunity to correct or prevent such statement or omission. The Company and the Underwriters agree that it would not be just and equitable if contribution pursuant to this subsection (d) were determined by *pro rata* allocation (even if the Underwriters were treated as one entity for such purpose) or by any other method of allocation which does not take account of the equitable considerations referred to above in this subsection (d). The amount paid or payable by an indemnified party as a result of the losses, claims, damages or liabilities (or

actions in respect thereof) referred to above in this subsection (d) shall be deemed to include any legal or other expenses reasonably incurred by such indemnified party in connection with investigating or defending any such action or claim. Notwithstanding the provisions of this subsection (d), no Underwriter shall be required to contribute any amount in excess of the amount by which the total price at which the Shares underwritten by it and distributed to the public were offered to the public exceeds the amount of any damages which such Underwriter has otherwise been required to pay by reason of such untrue or alleged untrue statement or omission or alleged omission. No person guilty of fraudulent misrepresentation (within the meaning of Section 11(f) of the Act) shall be entitled to contribution from any person who was not guilty of such fraudulent misrepresentation. The Underwriters' obligations in this subsection (d) to contribute are several in proportion to their respective underwriting obligations and not joint.

(e) The obligations of the Company under this Section 9 shall be in addition to any liability which the Company may otherwise have and shall extend, upon the same terms and conditions, to each employee, officer and director of each Underwriter and each person, if any, who controls any Underwriter within the meaning of the Act and each broker-dealer or other affiliate of any Underwriter; and the obligations of the Underwriters under this Section 9 shall be in addition to any liability which the respective Underwriters may otherwise have and shall extend, upon the same terms and conditions, to each officer and director of the Company and to each person, if any, who controls the Company within the meaning of the Act.

10. (a) The Company will indemnify and hold harmless the Directed Share Underwriter against any losses, claims, damages and liabilities to which the Directed Share Underwriter may become subject, under the Act or otherwise, insofar as such losses, claims damages or liabilities (or actions in respect thereof) (i) arise out of or are based upon an untrue statement or alleged untrue statement of a material fact contained in any material prepared by or with the consent of the Company for distribution to Participants in connection with the Directed Share Program or arise out of or are based upon the omission or alleged omission to state therein a material fact required to be stated therein or necessary to make the statements therein not misleading, (ii) arise out of or are based upon the failure of any Participant to pay for and accept delivery of Directed Shares that the Participant agreed to purchase, or (iii) are related to, arise out of or are in connection with the Directed Share Program, and will reimburse the Directed Share Underwriter for any legal or other expenses reasonably incurred by the Directed Share Underwriter in connection with investigating or defending any such action or claim as such expenses are incurred; provided, however, that the Company shall not be liable to the extent that any such loss, claim, damage or liability with respect to clause (i) above, arises out of or is based upon an untrue statement or alleged untrue statement or omission or alleged omission made in the Registration Statement, any Preliminary Prospectus, the Pricing Prospectus or the Prospectus, or any amendment or supplement thereto, or any Issuer Free Writing Prospectus or any Section 5(d) Writing, or any material prepared by or with the consent of the Company for distribution to Participants in connection with the Directed Share Program, in reliance upon and in conformity with the Underwriter Information; provided, further, the Company shall not be liable to the extent that any such loss, claim, damage or liability with respect to clauses (ii) and (iii) above, is finally judicially determined to have resulted from the bad faith or gross negligence of the Directed Share Underwriter.

(b) Promptly after receipt by the Directed Share Underwriter of notice of the commencement of any action, the Directed Share Underwriter shall, if a claim in respect

thereof is to be made against the Company, notify the Company in writing of the commencement thereof; provided that the failure to notify the Company shall not relieve the Company from any liability that it may have under the preceding paragraph of this Section 10 except to the extent that it has been materially prejudiced (through the forfeiture of substantive rights or defenses) by such failure; and provided further that the failure to notify the Company shall not relieve it from any liability that it may have to the Directed Share Underwriter otherwise than under the preceding paragraph of this Section 10. In case any such action shall be brought against the Directed Share Underwriter and it shall notify the Company of the commencement thereof, the Company shall be entitled to participate therein and, to the extent that it shall wish, to assume the defense thereof, with counsel satisfactory to the Directed Share Underwriter (who shall not, except with the consent of the Directed Share Underwriter, be counsel to the Company), and, after notice from the Company to the Directed Share Underwriter of its election so to assume the defense thereof, the Company shall not be liable to the Directed Share Underwriter under this subsection for any legal expenses of other counsel or any other expenses, in each case subsequently incurred by the Directed Share Underwriter, in connection with the defense thereof other than reasonable costs of investigation. The Company shall not, without the written consent of the Directed Share Underwriter, effect the settlement or compromise of, or consent to the entry of any judgment with respect to, any pending or threatened action or claim in respect of which indemnification or contribution may be sought hereunder (whether or not the Directed Share Underwriter is an actual or potential party to such action or claim) unless such settlement, compromise or judgment (i) includes an unconditional release of the Directed Share Underwriter from all liability arising out of such action or claim and (ii) does not include a statement as to or an admission of fault, culpability or a failure to act, by or on behalf of the Directed Share Underwriter.

(c) If the indemnification provided for in this Section 10 is unavailable to or insufficient to hold harmless the Directed Share Underwriter under subsection (a) above in respect of any losses, claims, damages or liabilities (or actions in respect thereof) referred to therein, then the Company shall contribute to the amount paid or payable by the Directed Share Underwriter as a result of such losses, claims, damages or liabilities (or actions in respect thereof) in such proportion as is appropriate to reflect the relative benefits received by the Company on the one hand and the Directed Share Underwriter on the other from the offering of the Directed Shares. If, however, the allocation provided by the immediately preceding sentence is not permitted by applicable law, then the Company shall contribute to such amount paid or payable by the Directed Share Underwriter in such proportion as is appropriate to reflect not only such relative benefits but also the relative fault of the Company on the one hand and the Directed Share Underwriter on the other in connection with any statements or omissions which resulted in such losses, claims, damages or liabilities (or actions in respect thereof), as well as any other relevant equitable considerations. The relative benefits received by the Company on the one hand and the Directed Share Underwriter on the other shall be deemed to be in the same proportion as the total net proceeds from the offering of the Directed Shares (before deducting expenses) received by the Company bear to the total underwriting discounts and commissions received by the Directed Share Underwriter for the Directed Shares. If the loss, claim, damage or liability arises out of or is based upon an untrue statement or alleged untrue statement of a material fact or arise out of or are based upon the omission or alleged omission to state therein a material fact required to be stated therein or necessary to make the statements therein not misleading, the relative fault shall be determined by reference to, among other things, whether the untrue or alleged untrue statement of a material fact or the omission or alleged omission to state a material fact relates to information supplied

by the Company on the one hand or the Directed Share Underwriter on the other and the parties' relative intent, knowledge, access to information and opportunity to correct or prevent such statement or omission. The Company and the Directed Share Underwriter agree that it would not be just and equitable if contribution pursuant to this subsection (c) were determined by pro rata allocation or by any other method of allocation which does not take account of the equitable considerations referred to above in this subsection (c). The amount paid or payable by the Directed Share Underwriter as a result of the losses, claims, damages or liabilities (or actions in respect thereof) referred to above in this subsection (c) shall be deemed to include any legal or other expenses reasonably incurred by the Directed Share Underwriter in connection with investigating or defending any such action or claim. Notwithstanding the provisions of this subsection (c), the Directed Share Underwriter shall not be required to contribute any amount in excess of the amount by which the total price at which the Directed Shares sold by it and distributed to the Participants exceeds the amount of any damages which the Directed Share Underwriter has otherwise been required to pay by reason of such untrue or alleged untrue statement or omission or alleged omission. No person guilty of fraudulent misrepresentation (within the meaning of Section 11(f) of the Act) shall be entitled to contribution from any person who was not guilty of such fraudulent misrepresentation.

(d) The obligations of the Company under this Section 10 shall be in addition to any liability which the Company may otherwise have and shall extend, upon the same terms and conditions, to each employee, officer and director of the Directed Share Underwriter and each person, if any, who controls the Directed Share Underwriter within the meaning of the Act and each broker-dealer or other affiliate of the Directed Share Underwriter.

11. (a) If any Underwriter shall default in its obligation to purchase the Shares which it has agreed to purchase hereunder at a Time of Delivery, you may in your discretion arrange for you or another party or other parties to purchase such Shares on the terms contained herein. If within thirty-six hours after such default by any Underwriter you do not arrange for the purchase of such Shares, then the Company shall be entitled to a further period of thirty-six hours within which to procure another party or other parties satisfactory to you to purchase such Shares on such terms. In the event that, within the respective prescribed periods, you notify the Company that you have so arranged for the purchase of such Shares, or the Company notifies you that it has so arranged for the purchase of such Shares, you or the Company shall have the right to postpone such Time of Delivery for a period of not more than seven days, in order to effect whatever changes may thereby be made necessary in the Registration Statement or the Prospectus, or in any other documents or arrangements, and the Company agrees to file promptly any amendments or supplements to the Registration Statement or the Prospectus which in your opinion may thereby be made necessary. The term "Underwriter" as used in this Agreement shall include any person substituted under this Section with like effect as if such person had originally been a party to this Agreement with respect to such Shares.

(b) If, after giving effect to any arrangements for the purchase of the Shares of a defaulting Underwriter or Underwriters by you and the Company as provided in subsection (a) above, the aggregate number of such Shares which remains unpurchased does not exceed one-eleventh of the aggregate number of all the Shares to be purchased at such Time of Delivery, then the Company shall have the right to require each non-defaulting Underwriter to purchase the number of Shares which such Underwriter agreed to purchase hereunder at such Time of Delivery and, in addition, to require each non-defaulting Underwriter to purchase its pro rata share (based on the number of Shares

which such Underwriter agreed to purchase hereunder) of the Shares of such defaulting Underwriter or Underwriters for which such arrangements have not been made; but nothing herein shall relieve a defaulting Underwriter from liability for its default.

(c) If, after giving effect to any arrangements for the purchase of the Shares of a defaulting Underwriter or Underwriters by you and the Company as provided in subsection (a) above, the aggregate number of such Shares which remains unpurchased exceeds one-eleventh of the aggregate number of all the Shares to be purchased at such Time of Delivery, or if the Company shall not exercise the right described in subsection (b) above to require non-defaulting Underwriters to purchase Shares of a defaulting Underwriter or Underwriters, then this Agreement (or, with respect to the Second Time of Delivery, the obligations of the Underwriters to purchase and of the Company to sell the Optional Shares) shall thereupon terminate, without liability on the part of any non-defaulting Underwriter or the Company, except for the expenses to be borne by the Company and the Underwriters as provided in Section 7 hereof and the indemnity and contribution agreements in Sections 9 and 10 hereof; but nothing herein shall relieve a defaulting Underwriter from liability for its default.

12. The respective indemnities, agreements, representations, warranties and other statements of the Company and the several Underwriters, as set forth in this Agreement or made by or on behalf of them, respectively, pursuant to this Agreement, shall remain in full force and effect, regardless of any investigation (or any statement as to the results thereof) made by or on behalf of any Underwriter or any controlling person of any Underwriter, or the Company, or any officer or director or controlling person of the Company, and shall survive delivery of and payment for the Shares.

13. If this Agreement shall be terminated pursuant to Section 11 hereof, the Company shall not then be under any liability to any Underwriter except as provided in Sections 7 and 9 hereof; but, if for any other reason, any Shares are not delivered by or on behalf of the Company as provided herein, the Company will reimburse the Underwriters through you for all out-of-pocket expenses approved in writing by you, including fees and disbursements of counsel, reasonably incurred by the Underwriters in making preparations for the purchase, sale and delivery of the Shares not so delivered, but the Company shall then be under no further liability to any Underwriter except as provided in Sections 7 and 9 hereof.

14. In all dealings hereunder, you shall act on behalf of each of the Underwriters, and the parties hereto shall be entitled to act and rely upon any statement, request, notice or agreement on behalf of any Underwriter made or given by you jointly or by the Representatives on behalf of the Underwriters.

All statements, requests, notices and agreements hereunder shall be in writing, and (A) if to the Underwriters shall be delivered or sent by mail or e-mail transmission to you as the representatives (i) in care of Goldman Sachs & Co. LLC, 200 West Street, New York, New York 10282-2198, Attention: Registration Department; (ii) in care of Jefferies LLC, Attention: Equity Syndicate Prospectus Department, 520 Madison Avenue, 2nd Floor, New York, NY 10022, or by e-mail at Prospectus_Department@Jefferies.com; and (iii) in care of Evercore Group L.L.C., Attention: Equity Capital Markets, 55 East 52nd Street, 36th Floor, New York, New York 10055, by e-mail at ecm.prospectus@evercore.com and (B) if to the Company shall be delivered or sent by mail to the address of the Company set forth on the cover of the Registration Statement, Attention: Chief Executive Officer; provided,

however, that any notice to an Underwriter pursuant to Section 9(c) hereof shall be delivered or sent by mail to such Underwriter at its address to be supplied to the Company by the Representatives upon request; provided, however, that notices under subsection 5(e) shall be in writing, and if to the Underwriters shall be delivered or sent by mail to you as the Representatives at Goldman Sachs & Co. LLC, 200 West Street, New York, New York 10282-2198, Attention: Control Room; and at Jefferies LLC, 520 Madison Avenue, 2nd Floor, New York, NY 10022, Attention: General Counsel; and at Evercore Group L.L.C., 55 East 52nd Street, 36th Floor, New York, New York 10055, Attention: [●]. Any such statements, requests, notices or agreements shall take effect upon receipt thereof.

In accordance with the requirements of the USA Patriot Act (Title III of Pub. L. 107-56 (signed into law October 26, 2001)), the Underwriters are required to obtain, verify and record information that identifies their respective clients, including the Company, which information may include the name and address of their respective clients, as well as other information that will allow the Underwriters to properly identify their respective clients.

15. This Agreement shall be binding upon, and inure solely to the benefit of, the Underwriters, the Company and, to the extent provided in Sections 9 and 12 hereof, the officers and directors of the Company and each person who controls the Company or any Underwriter, and their respective heirs, executors, administrators, successors and assigns, and no other person shall acquire or have any right under or by virtue of this Agreement. No purchaser of any of the Shares from any Underwriter shall be deemed a successor or assign by reason merely of such purchase.

16. Time shall be of the essence of this Agreement. As used herein, the term “business day” shall mean any day when the Commission’s office in Washington, D.C. is open for business.

17. The Company acknowledges and agrees that (i) the purchase and sale of the Shares pursuant to this Agreement is an arm’s-length commercial transaction between the Company, on the one hand, and the several Underwriters, on the other, (ii) in connection therewith and with the process leading to such transaction each Underwriter is acting solely as a principal and not the agent or fiduciary of the Company, (iii) no Underwriter has assumed an advisory or fiduciary responsibility in favor of the Company with respect to the offering contemplated hereby or the process leading thereto (irrespective of whether such Underwriter has advised or is currently advising the Company on other matters) or any other obligation to the Company except the obligations expressly set forth in this Agreement and (iv) the Company has consulted its own legal and financial advisors to the extent it deemed appropriate. The Company agrees that it will not claim that the Underwriters, or any of them, has rendered advisory services of any nature or respect, or owes a fiduciary or similar duty to the Company, in connection with such transaction or the process leading thereto.

18. This Agreement supersedes all prior agreements and understandings (whether written or oral) between the Company and the Underwriters, or any of them, with respect to the subject matter hereof.

19. This Agreement, any claim, controversy or disputes arising under or related to this Agreement and any transaction contemplated by this Agreement shall be governed by and construed in accordance with the laws of the State of New York without regard to principles of conflict of laws that would results in the application of any other law than the

laws of the State of New York. The Company agrees that any suit or proceeding arising in respect of this Agreement or any transaction contemplated by this Agreement will be tried exclusively in the U.S. District Court for the Southern District of New York or, if that court does not have subject matter jurisdiction, in any state court located in The City and County of New York and the Company agrees to submit to the jurisdiction of, and to venue in, such courts.

20. The Company and each of the Underwriters hereby irrevocably waives, to the fullest extent permitted by applicable law, any and all right to trial by jury in any legal proceeding arising out of or relating to this Agreement or the transactions contemplated hereby.

21. This Agreement may be executed by any one or more of the parties hereto in any number of counterparts, each of which shall be deemed to be an original, but all such counterparts shall together constitute one and the same instrument.

22. Notwithstanding anything herein to the contrary, the Company is authorized to disclose to any persons the U.S. federal and state income tax treatment and tax structure of the potential transaction and all materials of any kind (including tax opinions and other tax analyses) provided to the Company relating to that treatment and structure, without the Underwriters imposing any limitation of any kind. However, any information relating to the tax treatment and tax structure shall remain confidential (and the foregoing sentence shall not apply) to the extent necessary to enable any person to comply with securities laws. For this purpose, “tax structure” is limited to any facts that may be relevant to that treatment.

23. Recognition of the U.S. Special Resolution Regimes.

(a) In the event that any Underwriter that is a Covered Entity becomes subject to a proceeding under a U.S. Special Resolution Regime, the transfer from such Underwriter of this Agreement, and any interest and obligation in or under this Agreement, will be effective to the same extent as the transfer would be effective under the U.S. Special Resolution Regime if this Agreement, and any such interest and obligation, were governed by the laws of the United States or a state of the United States.

(b) In the event that any Underwriter that is a Covered Entity or a BHC Act Affiliate of such Underwriter becomes subject to a proceeding under a U.S. Special Resolution Regime, Default Rights under this Agreement that may be exercised against such Underwriter are permitted to be exercised to no greater extent than such Default Rights could be exercised under the U.S. Special Resolution Regime if this Agreement were governed by the laws of the United States or a state of the United States.

(c) As used in this section:

“BHC Act Affiliate” has the meaning assigned to the term “affiliate” in, and shall be interpreted in accordance with, 12 U.S.C. § 1841(k).

“Covered Entity” means any of the following:

(i) a “covered entity” as that term is defined in, and interpreted in accordance with, 12 C.F.R. § 252.82(b);

(ii) a “covered bank” as that term is defined in, and interpreted in accordance with, 12 C.F.R. § 47.3(b); or

(iii) a “covered FSI” as that term is defined in, and interpreted in accordance with, 12 C.F.R. § 382.2(b).

“Default Right” has the meaning assigned to that term in, and shall be interpreted in accordance with, 12 C.F.R. §§ 252.81, 47.2 or 382.1, as applicable.

“U.S. Special Resolution Regime” means each of (i) the Federal Deposit Insurance Act and the regulations promulgated thereunder and (ii) Title II of the Dodd-Frank Wall Street Reform and Consumer Protection Act and the regulations promulgated thereunder.

*[Signature Page Follows]*

If the foregoing is in accordance with your understanding, please sign and return to us a counterpart signature page, and upon the acceptance hereof by you, on behalf of each of the Underwriters, this letter and such acceptance hereof shall constitute a binding agreement between each of the Underwriters and the Company. It is understood that your acceptance of this letter on behalf of each of the Underwriters is pursuant to the authority set forth in a form of Agreement among Underwriters, the form of which shall be submitted to the Company for examination upon request, but without warranty on your part as to the authority of the signers thereof.

Very truly yours,

**Phathom Pharmaceuticals, Inc.**

By: _____
Name:
Title:

Accepted as of the date hereof:

**Goldman Sachs & Co. LLC**

By: _____
Name:
Title:

**Jefferies LLC**

By: _____
Name:
Title:

**Evercore Group L.L.C.**

By: _____
Name:
Title:

On behalf of each of the Underwriters

**SCHEDULE I**

| Underwriter | Total Number of Firm Shares to be Purchased | Number of Optional Shares to be Purchased if Maximum Option Exercised |
|---|---|---|
| Goldman Sachs & Co. LLC | [●] | [●] |
| Jefferies LLC | [●] | [●] |
| Evercore Group L.L.C. | [●] | [●] |
| Needham & Company, LLC | [●] | [●] |
| Total | [●] | [●] |

**SCHEDULE II**

(a) Issuer Free Writing Prospectuses not included in the Pricing Disclosure Package:

[Electronic roadshow dated [•]]

(b) Additional Documents Incorporated by Reference:

[None]

(c) Information other than the Pricing Prospectus that comprise the Pricing Disclosure Package:

The initial public offering price per share for the Shares is $[●]

The number of Shares purchased by the Underwriters is [●]

[Add any other pricing disclosure.]

(d) Section 5(d) Writings:

[Phathom Pharmaceuticals, Inc. Testing-the-Waters Presentation dated [●], 2019.]

**Form of Press Release**

**Phathom Pharmaceuticals, Inc.**
**[Date]**

Phathom Pharmaceuticals, Inc. (the "Company") announced today that Goldman Sachs & Co. LLC, Jefferies LLC and Evercore Group L.L.C., the lead book-running managers in the Company's recent public sale of shares of common stock, are [waiving] [releasing] a lock-up restriction with respect to shares of the Company's common stock held by [certain officers or directors] [an officer or director] of the Company. The [waiver] [release] will take effect on , 20 , and the shares may be sold on or after such date.

**This press release is not an offer for sale of the securities in the United States or in any other jurisdiction where such offer is prohibited, and such securities may not be offered or sold in the United States absent registration or an exemption from registration under the United States Securities Act of 1933, as amended.**

**Phathom Pharmaceuticals, Inc.**

**Form of Lock-Up Agreement**

_____, 2019

Goldman Sachs & Co. LLC
Jefferies LLC
Evercore Group L.L.C.

As representatives of the several Underwriters
named in Schedule I to the Underwriting Agreement,

c/o Goldman Sachs & Co. LLC
200 West Street
New York, NY 10282-2198

c/o Jefferies LLC
520 Madison Avenue
New York, New York 10022

c/o Evercore Group L.L.C.
55 East 52nd Street
New York, NY 10055

Re: Phathom Pharmaceuticals, Inc. – Lock-Up Agreement

Ladies and Gentlemen:

The undersigned understands that you, as representatives (the "Representatives"), propose to enter into an underwriting agreement (the "Underwriting Agreement") on behalf of the several Underwriters named in Schedule I to such agreement (collectively, the "Underwriters"), with Phathom Pharmaceuticals, Inc., a Delaware corporation (the "Company"), providing for a public offering (the "Public Offering") of the Common Stock of the Company (the "Shares") pursuant to a Registration Statement on Form S-1 to be filed with the Securities and Exchange Commission (the "SEC").

In consideration of the agreement by the Underwriters to offer and sell the Shares, and of other good and valuable consideration the receipt and sufficiency of which is hereby acknowledged, the undersigned agrees that, during the period beginning from the date of this Lock-Up Agreement and continuing to and including the date 180 days after the date set forth on the final prospectus (the "Prospectus") used to sell the Shares (the "Lock-Up Period"), the undersigned shall not, and shall not cause or direct any of its affiliates to, without the consent of the Representatives, (i) offer, sell, contract to sell, pledge, grant any option to purchase, lend or otherwise dispose of any shares of Common Stock of the Company, or any options or warrants to purchase any shares of Common Stock of the Company, or any securities convertible into, exchangeable for or that represent the right to receive shares of Common Stock of the Company (such options, warrants or other securities, collectively, "Derivative Instruments"), including without limitation any such shares or Derivative Instruments now owned or hereafter acquired by the undersigned, (ii) engage in any

hedging or other transaction or arrangement (including, without limitation, any short sale or the purchase or sale of, or entry into, any put or call option, or combination thereof, forward, swap or any other derivative transaction or instrument, however described or defined) which is designed to or which reasonably could be expected to lead to or result in a sale, loan, pledge or other disposition (whether by the undersigned or someone other than the undersigned), or transfer of any of the economic consequences of ownership, in whole or in part, directly or indirectly, of any shares of Common Stock of the Company or Derivative Instruments, whether any such transaction or arrangement (or instrument provided for thereunder) would be settled by delivery of Common Stock or other securities, in cash or otherwise (any such sale, loan, pledge or other disposition, or transfer of economic consequences, a "Transfer") or (iii) otherwise publicly announce any intention to engage in or cause any action or activity described in clause (i) above or transaction or arrangement described in clause (ii) above. The undersigned represents and warrants that the undersigned is not, and has not caused or directed any of its affiliates to be or become, currently a party to any agreement or arrangement that provides for, is designed to or which reasonably could be expected to lead to or result in any Transfer during the Lock-Up Period. If the undersigned is a director or officer of the Company, the undersigned agrees that the foregoing provisions shall be equally applicable to any issuer-directed or other Shares the undersigned may purchase in the Public Offering.

If the undersigned is not a natural person, the undersigned represents and warrants that no single natural person or entity beneficially owns, directly or indirectly, 50% or more of the equity interests (excluding any non-economic interests) in the undersigned, except for a natural person or entity that has executed a Lock-Up Agreement in substantially the same form as this Lock-Up Agreement. For purposes of this paragraph, "beneficially owns" shall mean solely a pecuniary interest under Rule 16a-1(a)(2) of the rules promulgated under the Securities Exchange Act of 1934, as amended (the "Exchange Act").

If the undersigned is an officer or director of the Company, (i) the Representatives agree that, at least three business days before the effective date of any release or waiver of the foregoing restrictions in connection with a transfer of shares of Common Stock, the Representatives will notify the Company of the impending release or waiver, and (ii) the Company has agreed or will agree in the Underwriting Agreement to announce the impending release or waiver by press release through a major news service at least two business days before the effective date of the release or waiver. Any release or waiver granted by the Representatives hereunder to any such officer or director shall only be effective two business days after the publication date of such press release. The provisions of this paragraph will not apply if (a) the release or waiver is effected solely to permit a transfer not for consideration and (b) the transferee has agreed in writing to be bound by the same terms described in this Lock-Up Agreement to the extent and for the duration that such terms remain in effect at the time of the transfer.

Notwithstanding the foregoing, the undersigned may, without the consent of the Representatives, Transfer the undersigned's shares of Common Stock of the Company and Derivative Instruments:

(i) as a *bona fide* gift or gifts;

(ii) to any trust for the direct or indirect benefit of the undersigned or the immediate family of the undersigned;

(iii) if the undersigned is a trust, to the trustor or beneficiary of such trust or to the estate of a beneficiary of such trust;

(iv) by will or intestate succession to the legal representative, heir or beneficiary of the undersigned;

(v) as a distribution to limited partners, members or stockholders of the undersigned;

(vi) to the undersigned's affiliates or to any investment fund or other entity controlled or managed by the undersigned;

(vii) pursuant to a court or regulatory agency order, a qualified domestic order or in connection with a divorce settlement, provided, (1) the Representatives receive a signed lock-up agreement in the same form as this Lock-Up Agreement for the balance of the Lock-Up Period from each transferee, (2) no public disclosure or filing shall be made voluntarily during the Lock-Up Period, and (3) any required filing under Section 16 of the Exchange Act, during the Lock-Up Period shall clearly indicate in the footnotes thereto that such Transfer relates to the circumstances described in this clause (vii);

(viii) to the Company as forfeitures to satisfy tax withholding and remittance obligations of the undersigned in connection with the vesting or exercise of equity awards granted pursuant to the Company's equity incentive plans or Derivative Instruments described in the Prospectus or Transfers to the Company pursuant to a net exercise or cashless exercise by the stockholder of outstanding equity awards pursuant to the Company's equity incentive plans or Derivative Instruments described in the Prospectus, provided any Common Stock of the Company issued upon vesting or exercise shall remain subject to the restrictions on transfer set forth in this Lock-Up Agreement, and provided, further, no public disclosure or filing shall be made voluntarily during the Lock-Up Period nor shall be required within 30 days after the date of the Prospectus, and after such 30th day, any required filing under Section 16 of the Exchange Act during the Lock-Up Period shall clearly indicate in the footnotes thereto that such Transfer is pursuant to the circumstances described in this clause (viii);

(ix) to the Company pursuant to any contractual arrangement disclosed in the Prospectus and in effect on the date of the Prospectus that provides for the repurchase by the Company or forfeiture of the undersigned's Common Stock of the Company or Derivative Instruments in connection with the termination of the undersigned's service to the Company, provided that (1) no public disclosure or filing shall be made voluntarily during the Lock-Up Period, and (2) any required filing under Section 16 of the Exchange Act made during the Lock-Up Period shall clearly indicate in the footnotes thereto that the filing relates to the circumstances described in this clause (ix);

(x) in connection with the conversion of the outstanding convertible notes into shares of Common Stock in connection with the consummation of the Public Offering as described in the Prospectus, provided, that, any such shares of Common Stock received upon such conversion shall remain subject to the provisions of this Lock-Up Agreement;

(xi) upon the completion of a *bona fide* third-party tender offer, merger, consolidation or other similar transaction that is approved by the Board of Directors of the Company and made to all holders of the Company's securities involving a change of control of the Company, provided that, in the event that such tender offer, merger, consolidation or other similar transaction is not completed, any Common Stock of the Company or Derivative Instruments held by the undersigned shall remain subject to the restrictions on transfer set forth in this Lock-Up Agreement (for purposes hereof, "change of control" shall mean the transfer (whether by tender offer, merger, consolidation or other similar transaction), in one

transaction or a series of related transactions, to a person or group of affiliated persons, of shares of capital stock if, after such transfer, such person or group of affiliated persons would hold more than 50% of the outstanding voting securities of the Company (or the surviving entity)); or

(xii) with the prior written consent of the Representatives on behalf of the Underwriters. In addition, with respect to clauses (i) through (vi) above, it shall be a condition to such transfer that (1) the Representatives receive a signed lock-up agreement in the same form as this Lock-Up Agreement for the balance of the Lock-Up Period from each donee, trustee, distributee or transferee, as the case may be, (2) any such transfer shall not involve a disposition for value and (3) no public filing or disclosure shall be required or voluntarily made during the Lock-Up Period in connection with such transfer. For purposes of this Lock-Up Agreement, "immediate family" shall mean any relationship by blood, marriage or adoption, not more remote than first cousin.

In addition, notwithstanding the foregoing, if the undersigned is a corporation, partnership, limited liability company, or similar entity, the undersigned may, without the consent of the Representatives, transfer shares of Common Stock of the Company to any wholly-owned subsidiary of such corporation, partnership, limited liability company or similar entity; provided, however, that in any such case, it shall be a condition to the transfer that the transferee execute an agreement stating that the transferee is receiving and holding such shares of Common Stock of the Company subject to the provisions of this Lock-Up Agreement and there shall be no further transfer of such capital stock except in accordance with this Lock-Up Agreement, and provided, further that any such transfer shall not involve a disposition for value and no public filing or disclosure shall be required or voluntarily made during the Lock-Up Period in connection with such transfer.

In addition, notwithstanding anything herein to the contrary, the undersigned may, without the consent of the Representatives, establish a trading plan that complies with Rule 10b5-1 under the Exchange Act (a "10b5-1 Trading Plan") or amend an existing 10b5-1 Trading Plan so long as there are no sales of Common Stock of the Company or Derivative Instruments under such plan during the Lock-Up Period; provided that, the establishment of a 10b5-1 Trading Plan or the amendment of a 10b5-1 Trading Plan, in either case, providing for sales of Common Stock of the Company or Derivative Instruments shall only be permitted if (i) the establishment or amendment of such plan is not required to be reported in any public report or filing with the SEC, or otherwise, and (ii) the undersigned does not otherwise voluntarily effect any public filing or report regarding the establishment or amendment of such plan.

Furthermore, the undersigned may, without the consent of the Representatives, sell shares of Common Stock of the Company purchased by the undersigned in the Public Offering or on the open market following the Public Offering if and only if (i) such sales are not required to be reported in any public report or filing with the SEC, or otherwise, during the Lock-Up Period and (ii) the undersigned does not otherwise voluntarily effect any public filing or report regarding such sales during the Lock-Up Period.

The undersigned now has, and, except as contemplated by any of clauses (i) through (xii) above, for the duration of this Lock-Up Agreement will have, good and marketable title to the undersigned's shares of Common Stock of the Company, free and clear of all liens, encumbrances, and claims whatsoever, other than (i) rights of repurchase or vesting conditions in favor of the Company or (ii) any charitable pledge of the undersigned's Common Stock of the Company that by its terms could not result in any transfer, disposition or distribution of such shares during the term of this Lock-Up Agreement.

The undersigned also agrees and consents to the entry of stop transfer instructions with the Company's transfer agent and registrar against the transfer of the undersigned's shares of Common Stock of the Company except in compliance with the foregoing restrictions.

The undersigned understands that the Company and the Underwriters are relying upon this Lock-Up Agreement in proceeding toward consummation of the Public Offering. The undersigned further understands that this Lock-Up Agreement is irrevocable and shall be binding upon the undersigned's heirs, legal representatives, successors, and assigns. The undersigned hereby represents and warrants that the undersigned has full power, capacity and authority to enter into this Lock-Up Agreement.

This Lock-Up Agreement shall terminate and the understand shall be released from all obligations under this Lock-Up Agreement, (i) if the Underwriting Agreement does not become effective by December 31, 2019, (ii) if the Underwriting Agreement (other than the provisions thereof which survive termination) shall terminate or be terminated prior to payment for and delivery of the Common Stock to be sold thereunder, (iii) if the Company files an application to withdraw the Registration Statement or (iv) if the Representatives, on behalf of the underwriters, advise the Company, or the Company advises the Representatives, in writing, prior to the execution of the Underwriting Agreement, that they have determined not to proceed with the Public Offering.

This Lock-Up Agreement and any claim, controversy or dispute arising under or related to this Lock-Up Agreement shall be governed by, and construed in accordance with, the laws of the State of New York, without regard to the conflict of laws principles thereof.

*[Signature page follows]*

Very truly yours,

Name of Security Holder *(Print exact name*)

By: Signature

If not signing in an individual capacity:

Name of Authorized Signatory *(Print*)

Title of Authorized Signatory *(Print*)

*(indicate capacity of person signing if signing as custodian, trustee, or on behalf of an entity)*

# AMENDED AND RESTATED CERTIFICATE OF INCORPORATION OF PHATHOM PHARMACEUTICALS, INC.

**(Pursuant to Sections 242 and 245 of the General Corporation Law of the State of Delaware)**

Phathom Pharmaceuticals, Inc., a corporation organized and existing under and by virtue of the provisions of the General Corporation Law of the State of Delaware (the "***General Corporation Law***"),

**DOES HEREBY CERTIFY**:

1. That the name of this corporation is Phathom Pharmaceuticals, Inc., and that this corporation was originally incorporated pursuant to the General Corporation Law on January 9, 2018 under the name North Bridge IV, Inc.

2. That the Board of Directors duly adopted resolutions proposing to amend and restate the Certificate of Incorporation of this corporation, declaring said amendment and restatement to be advisable and in the best interests of this corporation and its stockholders, and authorizing the appropriate officers of this corporation to solicit the consent of the stockholders therefor, which resolution setting forth the proposed amendment and restatement is as follows:

**RESOLVED**, that the Certificate of Incorporation of this corporation be amended and restated in its entirety to read as follows:

## I.

The name of this corporation is Phathom Pharmaceuticals, Inc.

## II.

The address of the registered office of the corporation in the State of Delaware is Corporation Service Company, 251 Little Falls Drive, City of Wilmington, County of New Castle, State of Delaware 19808, and the name of the registered agent of the corporation in the State of Delaware at such address is Corporation Service Company.

## III.

The purpose of this corporation is to engage in any lawful act or activity for which a corporation may be organized under the General Corporation Law.

## IV.

**A.** This corporation is authorized to issue only one class of stock, to be designated Common Stock. The total number of shares of Common Stock presently authorized is Ten Million (10,000,000), each having a par value of $0.0001.

**V.**

**A.** The management of the business and the conduct of the affairs of the corporation shall be vested in its Board of Directors. The number of directors which shall constitute, the whole Board of Directors shall be fixed by the Board of Directors in the manner provided in the Bylaws.

**B.** The Board of Directors is expressly empowered to adopt, amend or repeal the Bylaws of the corporation. The stockholders shall also have power to adopt, amend or repeal the Bylaws of the corporation; provided, however, that, in addition to any vote of the holders of any class or series of stock of the corporation required by law or by this Amended and Restated Certificate of Incorporation, such action by stockholders shall require the affirmative vote of the holders of at least a majority of the voting power of all of the then-outstanding shares of the capital stock of the corporation entitled to vote generally in the election of directors, voting together as a single class.

**VI.**

**A.** The corporation renounces, to the fullest extent permitted by law, any interest or expectancy of the corporation in, or in being offered an opportunity to participate in, any Excluded Opportunity. An "***Excluded Opportunity***" is any matter, transaction or interest that is presented to, or acquired, created or developed by, or which otherwise comes into the possession of (i) any director of the corporation who is not an employee of the corporation or any of its subsidiaries, or (ii) any holder of securities convertible into or exercisable for the capital stock of the corporation (including any shares of capital stock of the corporation issued upon the conversion or exercise thereof), or any partner, member, director, stockholder, employee, affiliate or agent of any such holder, other than someone who is an employee or consultant of the corporation or any of its subsidiaries (collectively, the persons referred to in clauses (i) and (ii) are "***Covered Persons***"), unless such matter, transaction or interest is presented to, or acquired, created or developed by, or otherwise comes into the possession of, a Covered Person expressly and solely in such Covered Person's capacity as a director of the corporation while such Covered Person is performing services in such capacity. Any repeal or modification of this Article VI will only be prospective and will not affect the rights under this Article VI in effect at the time of the occurrence of any actions or omissions to act giving rise to liability.

**VII.**

The corporation elects not to be governed by Section 203 of the General Corporation Law.

**VIII.**

**A.** To the fullest extent permitted by law, a director of the corporation shall not be personally liable to the corporation or its stockholders for monetary damages for breach of fiduciary duty as a director. If the General Corporation Law or any other law of the State of Delaware is amended after approval by the stockholders of this Article VIII to authorize corporate

action further eliminating or limiting the personal liability of directors, then the liability of a director of the corporation shall be eliminated or limited to the fullest extent permitted by the General Corporation Law as so amended.

**B.** Any repeal or modification of the foregoing provisions of this Article VIII by the stockholders of the corporation shall not adversely affect any right or protection of a director of the corporation existing at the time of, or increase the liability of any director of the corporation with respect to any acts or omissions of such director occurring prior to, such repeal or modification.

**IX.**

**A.** To the fullest extent permitted by applicable law, the corporation is authorized to provide indemnification of (and advancement of expenses to) directors, officers and agents of the corporation (and any other persons to which General Corporation Law permits the corporation to provide indemnification) through Bylaw provisions, agreements with such agents or other persons, vote of stockholders or disinterested directors or otherwise, in excess of the indemnification and advancement otherwise permitted by Section 145 of the General Corporation Law.

**B.** Any amendment, repeal or modification of the foregoing provisions of this Article IX shall not (i) adversely affect any right or protection of any director, officer or other agent of the corporation existing at the time of such amendment, repeal or modification or (ii) increase the liability of any director of the corporation with respect to any acts or omissions of such director, officer or agent occurring prior to, such amendment, repeal or modification.

**X.**

The corporation reserves the right to amend, alter, change or repeal any provision contained in this Amended and Restated Certificate of Incorporation, in the manner now or hereafter prescribed by statute, and all rights conferred upon the stockholders herein are granted subject to this reservation.

* * *

3. That the foregoing amendment and restatement was approved by the holders of the requisite number of shares of this corporation in accordance with Section 228 of the General Corporation Law.

4. That this Certificate of Incorporation, which restates and integrates and further amends the provisions of this corporation's Certificate of Incorporation, has been duly adopted in accordance with Sections 242 and 245 of the General Corporation Law.

**IN WITNESS WHEREOF**, this Amended and Restated Certificate of Incorporation has been executed by a duly authorized officer of this corporation on this 6th day of May, 2019.

By: /s/ David Socks
Name: David Socks
Title: President and Chief Executive Officer

**CERTIFICATE OF AMENDMENT**
**OF**
**AMENDED AND RESTATED CERTIFICATE OF INCORPORATION**

Phathom Pharmaceuticals, Inc. (the "***Corporation***") originally filed its Certificate of Incorporation with the Secretary of State of Delaware on January 9, 2018 under the name North Bridge IV, Inc., and is organized and existing under the General Corporation Law of the State of Delaware, hereby certifies as follows:

1. That the Board of Directors of said Corporation duly adopted resolutions proposing and declaring advisable the following amendments of the Amended and Restated Certificate of Incorporation (as amended, the "***Certificate***") of said Corporation. The resolutions setting forth the proposed amendments are as follows:

**RESOLVED**, that Article Fourth of the Certificate is hereby amended and restated in their entirety as follows:

"**A.** This corporation is authorized to issue only one class of stock, to be designated Common Stock. The total number of shares of Common Stock presently authorized is 50 million (50,000,000), each having a par value of $0.0001.

Effective upon the filing of this Certificate of Amendment with the Secretary of State of the State of Delaware, a 2.168-for-1 forward stock split for each share of Common Stock outstanding or held in treasury immediately prior to such time shall automatically and without any action on the part of the holders thereof occur (the "***Forward Stock Split***"). The par value of the Common Stock shall remain $0.0001 per share. This conversion shall apply to all shares of Common Stock. No fractional shares of Common Stock shall be issued upon the Forward Stock Split or otherwise. In lieu of any fractional shares of Common Stock to which the stockholder would otherwise be entitled upon the Forward Stock Split, the Company shall pay cash equal to such fraction multiplied by the then fair market value of the Common Stock as determined by the Company's Board of Directors.

All certificates representing shares of Common Stock outstanding immediately prior to the filing of this Certificate of Amendment shall immediately after the filing of this Certificate of Amendment represent instead the number of shares of Common Stock as provided above. Notwithstanding the foregoing, any holder of Common Stock may (but shall not be required to) surrender his, her or its stock certificate or certificates to the Company, and upon such surrender the holder may request that the Company issue a certificate for the correct number of shares of Common Stock to which the holder is entitled under the provisions of this Certificate of Amendment. Shares of Common Stock that were outstanding prior to the filing of this Certificate of Amendment, and that are not outstanding after and as a result of the filing of this Certificate of Amendment, shall resume the status of authorized but unissued shares of Common Stock."

2. That thereafter, pursuant to a resolution of the Board of Directors and in lieu of a meeting of stockholders, the stockholders gave their approval of said amendment by written consent in accordance with the provisions of Section 228 of the General Corporation Law of the State of Delaware.

3. That said amendment was duly adopted in accordance with the provisions of Sections 242 and 228 of the General Corporation Law of the State of Delaware.

4. That said amendment shall be executed, filed and recorded in accordance with Section 103 of the General Corporation Law of the State of Delaware.

[*Remainder of Page Intentionally Left Blank*]

**IN WITNESS WHEREOF**, this Certificate of Amendment has been executed by a duly authorized officer of the Corporation on this 11th day of October, 2019.

By: /s/ David Socks
Name: David Socks
Title: President and Chief Executive Officer

ZQ|CERT#|COY|CLS|RGSTRY|ACCT#|TRANSTYPE|RUN#|TRANS#

Phathom
PHARMACEUTICALS

MR A SAMPLE
DESIGNATION (IF ANY)
ADD 1
ADD 2
ADD 3
ADD 4

PO BOX 505000, Louisville, KY 40233-5000

CUSIP/IDENTIFIER
Holder ID
Insurance Value
Number of Shares
DTC

XXXXXX XX X
XXXXXXXXXX
1,000,000.00
123456
12345678 12345678901234 5

| Certificate Numbers | Num | No. | Denom. | Total |
|---|---|---|---|---|
| 12345678/12345678 | 1 | | 1 | |
| 12345678/12345678 | 2 | | 2 | |
| 12345678/12345678 | 3 | | 3 | |
| 12345678/12345678 | 4 | | 4 | |
| 12345678/12345678 | 5 | | 5 | |
| 12345678/12345678 | 6 | | 6 | |
| Total Transaction | | | | 7 |

**COMMON STOCK** PAR VALUE $0.0001

**COMMON STOCK**

Certificate Number
ZQ00000000

Shares

# Phathom™ PHARMACEUTICALS

## PHATHOM PHARMACEUTICALS, INC.

INCORPORATED UNDER THE LAWS OF THE STATE OF DELAWARE

SEE REVERSE FOR CERTAIN DEFINITIONS

CUSIP 71722W 10 7

THIS CERTIFIES THAT

MR. SAMPLE & MRS. SAMPLE &
MR. SAMPLE & MRS. SAMPLE

is the owner of

***ZERO HUNDRED THOUSAND
ZERO HUNDRED AND ZERO***

THIS CERTIFICATE IS TRANSFERABLE IN CITIES DESIGNATED BY THE TRANSFER AGENT, AVAILABLE ONLINE AT www.computershare.com

FULLY-PAID AND NON-ASSESSABLE SHARES OF COMMON STOCK OF

**Phathom Pharmaceuticals, Inc. (hereinafter called the "Company")**, transferable on the books of the Company in person or by duly authorized attorney, upon surrender of this Certificate properly endorsed. This Certificate and the shares represented hereby, are issued and shall be held subject to all of the provisions of the Certificate of Incorporation, as amended, and the By-Laws, as amended, of the Company (copies of which are on file with the Company and with the Transfer Agent), to all of which each holder, by acceptance hereof, assents. This Certificate is not valid unless countersigned and registered by the Transfer Agent and Registrar.

**Witness** the facsimile seal of the Company and the facsimile signatures of its duly authorized officers.

President and Chief Executive Officer

Chief Business Officer

PHATHOM PHARMACEUTICALS, INC. CORPORATE SEAL 1/9/2018 DELAWARE

DATED DD-MMM-YYYY

COUNTERSIGNED AND REGISTERED:
**COMPUTERSHARE TRUST COMPANY, N.A.**
TRANSFER AGENT AND REGISTRAR,

By _____
AUTHORIZED SIGNATURE

SECURITY INSTRUCTIONS ON REVERSE

123456

PHATHOM PHARMACEUTICALS, INC.

THE COMPANY WILL FURNISH WITHOUT CHARGE TO EACH SHAREHOLDER WHO SO REQUESTS, A SUMMARY OF THE POWERS, DESIGNATIONS, PREFERENCES AND RELATIVE, PARTICIPATING, OPTIONAL OR OTHER SPECIAL RIGHTS OF EACH CLASS OF STOCK OF THE COMPANY AND THE QUALIFICATIONS, LIMITATIONS OR RESTRICTIONS OF SUCH PREFERENCES AND RIGHTS, AND THE VARIATIONS IN RIGHTS, PREFERENCES AND LIMITATIONS DETERMINED FOR EACH SERIES, WHICH ARE FIXED BY THE CERTIFICATE OF INCORPORATION OF THE COMPANY, AS AMENDED, AND THE RESOLUTIONS OF THE BOARD OF DIRECTORS OF THE COMPANY, AND THE AUTHORITY OF THE BOARD OF DIRECTORS TO DETERMINE VARIATIONS FOR FUTURE SERIES. SUCH REQUEST MAY BE MADE TO THE OFFICE OF THE SECRETARY OF THE COMPANY OR TO THE TRANSFER AGENT. THE BOARD OF DIRECTORS MAY REQUIRE THE OWNER OF A LOST OR DESTROYED STOCK CERTIFICATE, OR HIS LEGAL REPRESENTATIVES, TO GIVE THE COMPANY A BOND TO INDEMNIFY IT AND ITS TRANSFER AGENTS AND REGISTRARS AGAINST ANY CLAIM THAT MAY BE MADE AGAINST THEM ON ACCOUNT OF THE ALLEGED LOSS OR DESTRUCTION OF ANY SUCH CERTIFICATE.

The following abbreviations, when used in the inscription on the face of this certificate, shall be construed as though they were written out in full according to applicable laws or regulations:

| | | |
|---|---|---|
| TEN COM - as tenants in common | UNIF GIFT MIN ACT | -.....(Cust).....Custodian.....(Minor)..... |
| TEN ENT - as tenants by the entireties | | under Uniform Gifts to Minors Act.....(State)..... |
| JT TEN - as joint tenants with right of survivorship and not as tenants in common | UNIF TRF MIN ACT | -.....(Cust).....Custodian (until age.....) |
| | | .....(Minor).....under Uniform Transfers to Minors Act.....(State)..... |

Additional abbreviations may also be used though not in the above list.

PLEASE INSERT SOCIAL SECURITY OR OTHER IDENTIFYING NUMBER OF ASSIGNEE

For value received,_____ hereby sell, assign and transfer unto

_____

(PLEASE PRINT OR TYPEWRITE NAME AND ADDRESS, INCLUDING POSTAL ZIP CODE, OF ASSIGNEE)

_____

_____

_____ Shares

of the common stock represented by the within Certificate, and do hereby irrevocably constitute and appoint

_____ Attorney

to transfer the said stock on the books of the within-named Company with full power of substitution in the premises.

Dated: _____ 20_____

Signature:_____

Signature:_____

Notice: The signature to this assignment must correspond with the name as written upon the face of the certificate, in every particular, without alteration or enlargement, or any change whatever.

Signature(s) Guaranteed: Medallion Guarantee Stamp

THE SIGNATURE(S) SHOULD BE GUARANTEED BY AN ELIGIBLE GUARANTOR INSTITUTION (Banks, Stockbrokers, Savings and Loan Associations and Credit Unions) WITH MEMBERSHIP IN AN APPROVED SIGNATURE GUARANTEE MEDALLION PROGRAM, PURSUANT TO S.E.C. RULE 17Ad-15.

SECURITY INSTRUCTIONS

THIS IS WATERMARKED PAPER. DO NOT ACCEPT WITHOUT NOTING WATERMARK. HOLD TO LIGHT TO VERIFY WATERMARK.

The IRS requires that the named transfer agent ("we") report the cost basis of certain shares or units acquired after January 1, 2011. If your shares or units are covered by the legislation, and you requested to sell or transfer the shares or units using a specific cost basis calculation method, then we have processed as you requested. If you did not specify a cost basis calculation method, then we have defaulted to the first in, first out (FIFO) method. Please consult your tax advisor if you need additional information about cost basis.

**If you do not keep in contact with the issuer or do not have any activity in your account for the time period specified by state law, your property may become subject to state unclaimed property laws and transferred to the appropriate state.**

153462

**Exhibit 4.5**

**PHATHOM PHARMACEUTICALS, INC.**

**NOTE PURCHASE AGREEMENT**

**May 7, 2019**

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**NOTE PURCHASE AGREEMENT**

**THIS NOTE PURCHASE AGREEMENT** ("Agreement") is made as of May 7, 2019, by and among Phathom Pharmaceuticals, Inc., a Delaware corporation (the "Company"), and the lenders (each, a "Lender" and collectively, the "Lenders") named on the Schedule of Lenders attached hereto (the "Schedule of Lenders"), and the Common Holders (as defined herein) (collectively, the "Parties"). Capitalized terms not otherwise defined in this Agreement shall have the meanings ascribed to them in Section 1 below.

**WHEREAS**, each of the Lenders intends to provide certain Consideration to the Company as described for each Lender on the Schedule of Lenders;

**WHEREAS**, the parties wish to provide for the sale and issuance of certain Notes in return for the provision by the Lenders of the Consideration to the Company; and

**WHEREAS**, the parties intend for the Company to issue in return for the Consideration one or more Notes that are convertible into shares of the Company's Equity Securities.

**NOW, THEREFORE, THE PARTIES HEREBY AGREE AS FOLLOWS:**

1. Definitions.

(a) "Affiliate" shall mean, with respect to any Person, any other Person who, directly or indirectly, controls, is controlled by, or is under common control with such Person, including, without limitation, any general partner, managing member, officer or director of such Person or any venture capital fund or other investment fund now or hereafter existing that is controlled by one or more general partners or managing members of, or shares the same management or advisory company with, such Person.

(b) "Board" means the Board of Directors of the Company.

(c) "Common Holder" shall mean the holders of Common Stock listed on Exhibit C attached hereto (collectively, the "Common Holders").

(d) "Common Stock" means shares of common stock, par value $0.0001, of the Company.

(e) "Company Intellectual Property" means all patents, patent applications, registered and unregistered trademarks, trademark applications, registered and unregistered service marks, service mark applications, tradenames, copyrights, trade secrets, domain names, mask works, information and proprietary rights and processes, similar or other intellectual property rights, subject matter of any of the foregoing, tangible embodiments of any of the foregoing, licenses in, to and under any of the foregoing, and any and all such cases that are owned or used by or are necessary to the Company in the conduct of the Company's business as now conducted and as presently proposed to be conducted.

(f) "Consideration" shall mean the amount of money paid by each Lender pursuant to this Agreement as shown on the Schedule of Lenders in the form of a check, wire transfer, cancellation or exchange of indebtedness, or any combination thereof.

(g) "Conversion Cap Price Per Share" shall mean the quotient obtained by dividing the following:

(i) the Valuation Cap less the aggregate principal amount and accrued interest under the Notes, by

(ii) the Pre-closing Capitalization.

(h) "Conversion Price" shall mean:

(i) with respect to a conversion pursuant to Section 2.2(a) below, the lesser of (A) the Discounted Conversion Price or (B) the Conversion Cap Price Per Share;

(ii) with respect to a conversion pursuant to Section 2.2(b) below, the Non-Qualified Discounted Conversion Price;

(iii) with respect to a conversion pursuant to Section 2.2(c) below, the Conversion Cap Price Per Share;

(iv) with respect to a conversion pursuant to Section 2.2(d) below, the lesser of (A) the Discounted Conversion Price or (B) the Conversion Cap Price Per Share; and

(v) with respect to a conversion pursuant to Section 2.2(e) below, the Conversion Cap Price Per Share.

(i) "Conversion Shares" shall, for purposes of determining the type of Equity Securities issuable upon conversion of the Notes, mean:

(i) if the Notes are converted to equity pursuant to Section 2.2(a) below, the Equity Securities issued in the Next Equity Financing;

(ii) if the Notes are converted to equity pursuant to Section 2.2(b) below, the Equity Securities issued in the Non-Qualified Next Equity Financing;

(iii) if the Notes are converted to equity pursuant to Section 2.2(c) below, shares of Common Stock;

(iv) if the Notes are converted to equity pursuant to Section 2.2(d) below, shares of Common Stock; and

(v) if the Notes are converted to equity pursuant to Section 2.2(e) below, shares of Common Stock.

(j) "Corporate Transaction" shall mean (A) the closing of the sale, transfer or other disposition of all or substantially all of this Company's assets, (B) the consummation of the

merger or consolidation of this Company with or into another entity (except a merger or consolidation in which the holders of capital stock of this Company immediately prior to such merger or consolidation continue to hold at least 50% of the voting power of the capital stock of this Company or the surviving or acquiring entity in substantially identical proportions and with substantially identical rights, preferences, privileges and restrictions as existed immediately prior to such transaction), (C) the closing of the transfer (whether by merger, consolidation or otherwise), in one transaction or a series of related transactions, to a person or group of affiliated persons (other than an underwriter of this corporation's securities), of this Company's securities if, after such closing, such person or group of affiliated persons would hold 50% or more of the outstanding voting stock of this Company (or the surviving or acquiring entity) or (D) a liquidation, dissolution or winding up of this Company; provided, however, that a transaction shall not constitute a Corporate Transaction if its sole purpose is to change the state of this Company's incorporation or to create a holding company that will be owned in substantially the same proportions by the persons who held this Company's securities immediately prior to such transaction. Notwithstanding the prior sentence, the sale of shares of Preferred Stock in a bona fide financing transaction for the purposes of raising operating capital to bona fide institutional, venture capital, private equity and similar investors shall not be deemed a "Corporate Transaction."

(k) "Discounted Conversion Price" shall equal 80% of the New Purchase Price.

(l) "Equity Securities" shall mean the Company's Common Stock or Preferred Stock or any securities conferring the right to purchase the Company's Common Stock or Preferred Stock or securities directly or indirectly convertible into, or exchangeable for (with or without additional consideration), the Company's Common Stock or Preferred Stock.

(m) "Exchange Act" shall mean the Securities Exchange Act of 1934, as amended.

(n) "Form S-3" shall mean such form under the Securities Act as in effect on the date hereof or any registration form under the Securities Act subsequently adopted by the SEC that permits inclusion or incorporation of substantial information by reference to other documents filed by the Company with the SEC.

(o) "Frazier" shall mean Frazier Life Sciences IX, L.P.

(p) "Free Writing Prospectus" shall mean a free-writing prospectus, as defined in Rule 405.

(q) "Fully Diluted Capital Stock" shall mean the filly-diluted outstanding capital stock of the Company, including (i) outstanding shares of Common Stock (i) outstanding shares of Preferred Stock (on an as-converted basis), (ii) outstanding vested and unvested stock options and all shares of Common Stock held in reserve in any of the Company's equity incentive plans that are not then yet allocated for outstanding and unexercised stock options, (iii) outstanding warrants (on an as-exercised basis), and (iv) other outstanding convertible securities (on an as-converted basis), including the Notes.

(r) "Holder" shall mean any Person owning or having the right to acquire Registrable Securities or any assignee thereof in accordance with Section 7.5(j) of this Agreement.

(s) "Initial Public Offering" shall mean the closing of the issuance and sale of shares of Equity Securities of the Company in the Company's first firm-commitment underwritten public offering pursuant to an effective registration statement under the Securities Act in which the gross cash proceeds to the Company (before underwriting discounts, commissions and fees) are at least $75,000,000 (excluding the aggregate amount of debt securities converted into Equity Securities upon conversion of convertible indebtedness, including, without limitation, the Notes converted pursuant to Section 2.2 below) or such lesser amount as may be approved by the Requisite Noteholders.

(t) "Key Employee" means any executive-level employee (including division director and vice president-level positions) as well as any employee or consultant who either alone or in concert with others develops, invents, programs or designs any Company Intellectual Property.

(u) "Material Adverse Effect" means a material adverse effect on the business, assets (including intangible assets), liabilities, financial condition, property, prospects or results of operations of the Company.

(v) "Maturity Date" shall mean May 7, 2020.

(w) "New Purchase Price" shall mean the price paid per share in cash for Equity Securities by the investors in the Initial Public Offering, Next Equity Financing or the Non-Qualified Next Equity Financing, as applicable, other than as a result of conversion of indebtedness.

(x) "Next Equity Financing" shall mean the next sale (or series of related sales) by the Company of its Equity Securities following the date of this Agreement primarily for bona fide equity financing purposes from which the Company receives gross proceeds of not less than $75,000,000 (excluding the aggregate amount of debt securities converted into Equity Securities upon conversion of convertible indebtedness, including, without limitation, the Notes converted pursuant to Section 2.2 below).

(y) "Non-Qualified Discounted Conversion Price" shall equal the Discounted Conversion Price unless otherwise agreed between the Company and Requisite Noteholders.

(z) "Non-Qualified Next Equity Financing" shall mean the next sale (or series of related sales) by the Company of its Equity Securities following the date of this Agreement primarily for bona fide equity financing purposes from which the Company receives gross proceeds of less than $75,000,000 (excluding the aggregate amount of debt securities converted into Equity Securities upon conversion of convertible indebtedness, including, without limitation, the Notes converted pursuant to Section 2.2 below).

(aa) "Notes" shall mean the one or more promissory notes issued to each Lender pursuant to Section 2.1 below, the form of which is attached hereto as Exhibit A.

(bb) "Person" shall mean any individual, corporation, partnership, trust, limited liability company, association or other entity.

(cc) "Pre-closing Capitalization" shall mean the sum determined immediately prior to the applicable conversion of the Notes of:

(i) the number of shares of Common Stock of the Company then outstanding immediately prior to the closing of the applicable conversion event, plus

(ii) the number of shares of Common Stock issuable, directly or indirectly, upon the exercise or conversion of exercisable or convertible securities then outstanding immediately prior to the closing of the applicable conversion event, plus

(iii) the number of shares of capital stock (determined on an as-converted to Common Stock basis) reserved for issuance under the Company's equity incentive plans (net of any such shares underlying securities included in clause (ii) of this definition) including, in the event of a conversion of the Notes in the Next Equity Financing, any increase in the number of such reserved shares expressly required by the terms and conditions of such Next Equity Financing.

(dd) "Preferred Stock" means shares of preferred stock of the Company.

(ee) "register," "registered," and "registration" shall refer to a registration effected by preparing and filing a registration statement or similar document in compliance with the Securities Act, and the declaration or ordering of effectiveness of such registration statement or document.

(ff) "Registrable Securities" shall mean (i) the Equity Securities issued or issuable, directly or indirectly, upon conversion of the Notes in accordance with the terms of this Agreement, excluding in all cases, however, any Registrable Securities sold by a Person in a transaction in which his, her or its rights under Section 7.5 of this Agreement are not assigned, (ii) any shares of Common Stock held by Frazier and (iii) any shares of Common Stock (including shares of Common Stock issuable upon the exercise or conversion of any securities exercisable or convertible into shares of Common Stock) held by Takeda. In addition, the number of shares of Registrable Securities outstanding shall equal the aggregate of the number of shares of Common Stock outstanding that are, and the number of shares of Common Stock issuable, directly or indirectly, pursuant to then exercisable or convertible securities that are, Registrable Securities.

(gg) "Requisite Noteholders" shall mean the holders of not less than sixty percent (60%) in interest of the aggregate outstanding principal amount of the Notes, including Frazier.

(hh) "Rule 144" shall mean Rule 144 under the Securities Act.

(ii) "Rule 144(b)(1)(i)" shall mean subsection (b)(1)(i) of Rule 144 under the Securities Act as it applies to Persons who have held shares for more than one (1) year.

(jj) "Rule 405" shall mean Rule 405 under the Securities Act.

(kk) "Sale of the Company" shall mean either: (a) a transaction or series of related transactions in which a person, or a group of related persons, acquires from stockholders of the Company shares representing more than fifty percent (50%) of the outstanding voting power of the Company (a "Stock Sale") or (b) a Corporate Transaction.

(ll) "SEC" shall mean the Securities and Exchange Commission.

(mm) "Securities Act" shall mean the Securities Act of 1933, as amended.

(nn) "Shares" shall mean and include any securities of the Company the holders of which are entitled to vote for one or more members of the Board, including without limitation, all shares of Common Stock, by whatever name called, now owned or subsequently acquired by a stockholder, however acquired, whether through stock splits, stock dividends, reclassifications, recapitalizations, similar events or otherwise.

(oo) "Takeda" shall mean Takeda Pharmaceutical Company Limited.

(pp) "Takeda Agreements" shall mean the Takeda License, Takeda Supply Agreement and Takeda Equity Documents.

(qq) "Takeda License" shall mean that certain License Agreement by and between the Company and Takeda dated May 7, 2019.

(rr) "Takeda Equity Documents" shall mean that certain Stock Issuance Agreement and Warrant to Purchase Shares of Common Stock by and between the Company and Takeda and the other requisite parties thereto.

(ss) "Takeda Supply Agreement" shall mean that certain Clinical Supply Agreement by and between the Company and Takeda dated May 7, 2019.

(tt) "Transfer" shall mean any sale, assignment, encumbrance, hypothecation, pledge, conveyance in trust, gift, transfer by bequest, devise or descent, or other transfer or disposition of any kind, including, without limitation, transfers pursuant to divorce or legal separation, transfers to receivers, levying creditors, trustees or receivers in bankruptcy proceedings or general assignees for the benefit of creditors, whether voluntary, involuntarily or by operation of law, directly or indirectly, of any of the Equity Securities.

(uu) "Valuation Cap" shall mean $500,000,000.

2. Terms of the Convertible Notes.

2.1 Issuance of Convertible Notes. In return for the Consideration paid by each Lender, the Company shall sell and issue to such Lender one or more Notes. Each Note shall have a principal balance equal to the Consideration paid by such Lender for the Note, as set forth in the Schedule of Lenders. Each Note shall be convertible into Conversion Shares pursuant to Section 2.2 below.

2.2 Right to Convert Notes.

(a) Next Equity Financing. The then outstanding principal and unpaid accrued interest of each Note shall be automatically converted into Conversion Shares upon the closing of the Next Equity Financing. Notwithstanding the foregoing, accrued interest on each Note may be paid in cash upon mutual agreement of the Company and the applicable Lender. The number of Conversion Shares to be issued upon such conversion shall be equal to the quotient obtained by dividing (i) the outstanding principal and unpaid accrued interest on a Note to be converted on the date of conversion by (ii) the Conversion Price. At least twenty (20) calendar days prior to the closing of the Next Equity Financing, the Company shall notify the holder of each Note in writing of the terms (in reasonable summary detail) under which the Equity Securities will be sold in such financing. Subject to Section 8.12 below, the issuance of Conversion Shares pursuant to the conversion of each Note shall otherwise be upon and subject to the same terms and conditions applicable to the Equity Securities sold in the Next Equity Financing.

(b) Non-Qualified Next Equity Financing. The then outstanding principal and unpaid accrued interest of each Note may be converted, at the option of the holder thereof into Conversion Shares upon the closing of the Non-Qualified Next Equity Financing. Notwithstanding the foregoing, accrued interest on each Note may be paid in cash upon mutual agreement of the Company and the applicable Lender. The number of Conversion Shares to be issued upon such conversion shall be equal to the quotient obtained by dividing (i) the outstanding principal and unpaid accrued interest on a Note to be converted on the date of conversion by (ii) the Conversion Price. At least twenty (20) calendar days prior to the closing of the Non-Qualified Next Equity Financing, the Company shall notify the holder of each Note in writing of the terms (in reasonable summary detail) under which the Equity Securities will be sold in such financing. Subject to Section 8.12 below, the issuance of Conversion Shares pursuant to the conversion of each Note shall otherwise be upon and subject to the same terms and conditions applicable to the Equity Securities sold in the Non-Qualified Next Equity Financing. If a holder elects to convert its Note into Conversion Shares in connection with the Non-Qualified Next Equity Financing, such holder shall inform the Company of its election within twenty (20) calendar days after such notice is effectively given by the Company pursuant to Section 8.5 hereof. In the event that a holder fails to inform the Company of its election within such twenty (20) calendar day period, such holder's Note shall thereafter cease to be convertible into Conversion Shares to be issued pursuant to the Non-Qualified Next Equity Financing; provided, however, such Note shall continue to accrue interest at the interest rate applicable to such Note until the redemption thereof.

(c) Treatment upon Maturity. If the Next Equity Financing, Non-Qualified Next Equity Financing pursuant to which such Note has converted, Corporate Transaction or Initial Public Offering has not occurred on or before the Maturity Date, the principal and unpaid accrued interest of each Note may be converted, at any time following the Maturity Date, at the option of the holder thereof, into Conversion Shares; provided that each Note, to the extent such Note has not already been converted into Conversion Shares at the option of the holder thereof, shall be due and payable in cash following the Maturity Date solely upon demand of the Requisite Noteholders. The number of Conversion Shares to be issued upon conversion shall be equal to the quotient obtained by dividing (i) the outstanding principal and

unpaid accrued interest due on a Note to be converted on the date of the conversion by (ii) the Conversion Price. Notwithstanding anything to contrary in this Section 2.2(c), in the event that a Note is not converted pursuant to this Section 2.2(c) and a Next Equity Financing, Non-Qualified Next Equity Financing pursuant to which such Note has converted, Corporate Transaction or Initial Public Offering has not occurred on or before the third anniversary of the Initial Closing, then on such third anniversary, the outstanding principal and accrued interest shall become immediately due and payable.

(d) Initial Public Offering. Notwithstanding subsections (a), (b) or (c) above, in the event of an Initial Public Offering prior to full payment of a Note or the prior conversion of a Note (as provided herein), all outstanding principal and unpaid accrued interest due on such Note shall be converted into Conversion Shares immediately prior to the closing of the Initial Public Offering. The number of Conversion Shares to be issued upon conversion shall be equal to the quotient, obtained by dividing (x) the outstanding principal and unpaid accrued interest due on a Note to be converted on the date of the conversion by (y) the Conversion Price.

(e) Corporate Transaction. In the event of a Corporate Transaction prior to full payment of a Note or the prior conversion of a Note (as provided herein), the greater of (i) an amount equal to two times (2x) the then outstanding principal and accrued interest due on such Note or (ii) an amount equal to the proceeds (including, for the avoidance of doubt, any escrowed or contingent consideration payable to stockholders in such Corporate Transaction) which would be payable assuming all outstanding principal and unpaid accrued interest due on such Note were converted into Conversion Shares immediately prior to the closing of the Corporate Transaction shall be due and payable in full prior to the closing of the Corporate Transaction. The number of Conversion Shares which would be issued upon conversion shall be equal to the quotient, obtained by dividing (x) the outstanding principal and unpaid accrued interest due on a Note to be converted on the date of the conversion by (y) the Conversion Price.

(f) No Fractional Shares. Upon the conversion of a Note into Conversion Shares, in lieu of any fractional shares to which the holder of the Note would otherwise be entitled, the Company shall pay the Note holder cash equal to such fraction multiplied by the Conversion Price.

(g) Mechanics of Conversion. The Company shall not be required to issue or deliver the Conversion Shares with respect to any Note until (i) the holder of such Note has (A) surrendered such Note to the Company or (B) provided the Company evidence reasonably satisfactory to the Company of the ownership of and the loss, theft, destruction or mutilation of such Note, including but not limited to an indemnity agreement reasonably satisfactory in form and amount to the Company, and (ii) (A) the closing of the applicable Next Equity Financing, Non-Qualified Next Equity Financing pursuant to which such Note is converted, Initial Public Offering or Corporate Transaction, or (B) the Maturity Date in the event such Note converts pursuant to Section 2.2(c). Additionally, before any Note holder shall be entitled to convert such holder's Note into Conversion Shares pursuant to Section 2.2(b), such holder shall give written notice to the Company of the election to convert such Note into Conversion Shares.

3. Closing Mechanics.

3.1 Initial Closing. The closing (the "Initial Closing") of the purchase of the Notes in return for the Consideration paid by each Lender (as set forth on the Schedule of Lenders) shall take place remotely via teleconference, e-mail or likewise at 10 a.m., on May 7, 2019, or at such other time and place as the Company and Lenders purchasing a majority in interest of the aggregate principal amount of the Notes to be sold at the Initial Closing agree upon orally or in writing. At the Initial Closing, each Lender shall deliver the Consideration to the Company set forth opposite such Lender's name on the Schedule of Lenders and the Company shall deliver to each Lender one or more executed Notes in return for the respective Consideration provided to the Company. In the event that payment by a Lender is made, in whole or in part, by cancellation or exchange of indebtedness, then such Lender shall surrender to the Company for cancellation or exchange at the Initial Closing any evidence of such indebtedness.

3.2 Second Closing. The second closing (the "Second Closing") of the purchase of the Notes in return for the Consideration paid by each Lender (as set forth on the Schedule of Lenders) shall take place remotely via teleconference, e-mail or likewise at any time on or before the 20th day following the Initial Closing, or at such other time and place as the Company and Lenders purchasing a majority in interest of the aggregate principal amount of the Notes to be sold at the Second Closing agree upon orally or in writing; provided, that such sale shall not take place later than the earlier to occur of the date of a Next Equity Financing, Non-Qualified Next Equity Financing, Initial Public Officer or Corporate Transaction (whichever occurs earliest) is consummated. At the Second Closing, each Lender shall deliver the Consideration to the Company set forth opposite such Lender's name on the Schedule of Lenders and the Company shall deliver to each Lender one or more executed Notes in return for the respective Consideration provided to the Company. Each of the Initial Closing and the Second Closing shall be referred to herein as the "Closing."

3.3 Conditions of Lenders' Obligations at Closing. The obligations of each Lender under Section 3.1 or Section 3.2 of this Agreement are subject to the fulfillment on or before such Closing of each of the following conditions, the waiver of which shall not be effective against any Lender who does not consent thereto:

(a) Representations and Warranties. The representations and warranties of the Company contained in Section 4 shall be true on and as of the Initial Closing.

(b) Proceedings and Documents. All corporate and other proceedings in connection with the transactions contemplated at the Closing and all documents incident thereto shall be reasonably satisfactory in form and substance to the special counsel for the Lenders, and they shall have received all such counterpart original and certified or other copies of such documents as they may reasonably request.

(c) Board of Directors. On or prior to the Initial Closing, the directors of the Company shall be Messrs. David Socks, James Topper, Tadataka Yamada, M.D. and Jon Edwards and there shall be three vacancies on the Board.

(d) Management Rights Letter. On or prior to the Initial Closing, the Company and each Lender that has requested one shall have entered into a Management Rights Letter in the form attached hereto as Exhibit D.

(e) Indemnification Agreement. The Company and each member of the Board shall have entered into an Indemnification Agreement in the form attached hereto as Exhibit E.

(f) Absence of Defaults. No Event of Default shall have occurred and be continuing.

(g) Issuance of Notes. Such Lender shall have received from the Company a duly executed Note as required by this Agreement.

(h) Takeda License. The Takeda License (and related Takeda Equity Documents and the Takeda Supply Agreement) in form reasonably acceptable to Frazier shall have been executed, and an executed copy shall have been delivered to each Lender.

3.4 Conditions of the Company's Obligations at Closing. The obligations of the Company to each Lender under this Agreement are subject to the fulfillment on or before the Closing of each of the following conditions by that Lender:

(a) Representations and Warranties. The representations and warranties of the Lenders contained in Section 5 shall be true on and as of the Closing.

(b) Payment of Consideration. The Lender shall have delivered the Consideration specified in Section 3.1 or Section 3.2, as applicable.

4. Representations and Warranties of the Company. The Company hereby represents and warrants to each Lender that, except as set forth on the Disclosure Schedule attached as Exhibit F to this Agreement, which exceptions shall be deemed to be part of the representations and warranties made hereunder, the following representations are true and complete as of the date of the Initial Closing, except as otherwise indicated. The Disclosure Schedule shall be arranged in sections corresponding to the numbered and lettered sections and subsections contained in this Section 4, and the disclosures in any section or subsection of the Disclosure Schedule shall qualify other sections and subsections in this Section 4 only to the extent it is readily apparent from a reading of the disclosure that such disclosure is applicable to such other sections and subsections.

4.1 Organization, Good Standing and Qualification. The Company is a corporation duly incorporated and organized, validly existing, and in good standing under the laws of the State of Delaware and has all requisite corporate power and authority to own and operate its properties and assets and to carry on its business as now conducted. The Company is duly qualified to transact business and is in good standing in each jurisdiction in which the failure to so qualify would have a Material Adverse Effect.

4.2 Capitalization.

(a) The authorized capital of the Company consists, immediately prior to the Initial Closing, of 10,000,000 shares of Common Stock, 5,470,600 of which are issued and outstanding immediately prior to the Initial Closing. All of the outstanding shares of Common Stock have been duly authorized, are fully paid and nonassessable and were issued in compliance with all applicable federal and state securities laws.

(b) The Company has not authorized any shares of Preferred Stock.

(c) 1,029,400 shares of Common Stock are authorized for issuance to employees, consultants and directors pursuant to the Company's 2019 Equity Incentive Plan, none of which are subject to outstanding option awards.

(d) Section 4.2(d) of the Disclosure Schedule sets forth the capitalization of the Company immediately following the Initial Closing including the number of shares of the following: (i) issued and outstanding Common Stock, including, with respect to restricted Common Stock, vesting schedule and repurchase price; and (ii) warrants or stock purchase rights, if any. Except for (A) the conversion privileges of the Notes to be issued under this Agreement, (B) the rights provided in Section 7.2 of this Agreement, and (C) the securities and rights described in Section 4.2(d) of the Disclosure Schedule, there are no outstanding options, warrants, rights (including conversion or preemptive rights and rights of first refusal or similar rights) or agreements, orally or in writing, to purchase or acquire from the Company any shares of Common Stock, or any securities convertible into or exchangeable for shares of Common Stock. All outstanding shares of the Company's Common Stock and all shares of the Company's Common Stock underlying outstanding options are subject to (i) a right of first refusal in favor of the Company upon any proposed transfer (other than transfers for estate planning purposes); and (ii) a lock-up or market standoff agreement of not less than one hundred eighty (180) days following the Initial Public Offering pursuant to a registration statement filed with the SEC under the Securities Act.

(e) Unless otherwise set forth in Section 4.2(d) of the Disclosure Schedule, none of the Company's stock purchase agreements contains a provision for acceleration of vesting (or lapse of a repurchase right) or other changes in the vesting provisions or other terms of such agreement or understanding upon the occurrence of any event or combination of events. The Company has never adjusted or amended the exercise price of any stock options previously awarded, whether through amendment, cancellation, replacement grant, repricing, or any other means. The Company has no obligation (contingent or otherwise) to purchase or redeem any of its capital stock.

4.3 Subsidiaries. The Company does not currently own or control, directly or indirectly, any interest in any other corporation, partnership, trust, joint venture, limited liability company, association, or other business entity. The Company is not a participant in any joint venture, partnership or similar arrangement.

4.4 Authorization. Except for the authorization and issuance of the shares issuable, directly or indirectly, in connection with the conversion of the Notes, all corporate action has been taken on the part of the Company, its officers, directors and stockholders necessary for the authorization, execution, delivery and performance of this

Agreement and the Notes. Except as may be limited by applicable bankruptcy, insolvency, reorganization, or similar laws relating to or affecting the enforcement of creditors' rights, the Company has taken all corporate action required to make all of the obligations of the Company reflected in the provisions of this Agreement and the Notes, the valid and enforceable obligations they purport to be.

4.5 Compliance with Other Instruments. The Company is not in violation or default (i) of any provisions of its Certificate of Incorporation or Bylaws, (ii) of any instrument, judgment, order, writ or decree, (iii) under any note, indenture or mortgage, or (iv) under any lease, agreement, contract or purchase order to which it is a party or by which it is bound that is required to be listed on the Disclosure Schedule, or (v) to its knowledge, of any provision of federal or state statute, rule or regulation applicable to the Company, the violation of which would have a Material Adverse Effect. The execution, delivery and performance of this Agreement and the issuance and delivery of the Notes and the Conversion Shares, and any shares of Common Stock directly or indirectly issued in respect thereof, and the consummation of the transactions contemplated hereby and thereby will not result in any such violation or be in conflict with or constitute, with or without the passage of time and giving of notice, either (i) a default under any such provision, instrument, judgment, order, writ, decree, contract or agreement; or (ii) an event which results in the creation of any lien, charge or encumbrance upon any assets of the Company or the suspension, revocation, forfeiture, or nonrenewal of any material permit or license applicable to the Company.

4.6 Governmental Consents and Filings. Assuming the accuracy of the representations made by the Lenders in Section 5 of this Agreement, no consent, approval, order or authorization of, or registration, qualification, designation, declaration or filing with, any federal, state or local governmental authority is required on the part of the Company in connection with the consummation of the transactions contemplated by this Agreement, other than a Form D or other qualifications or filings under applicable federal and state securities laws, which qualification or filings will be made on a timely basis.

4.7 Litigation. There is no claim, action, suit, proceeding, arbitration, complaint, charge or investigation pending or to the Company's knowledge, currently threatened in writing (i) against the Company or any officer, director or Key Employee of the Company arising out of their employment or board relationship with the Company; (ii) that questions the validity of this Agreement or the Notes or the right of the Company to enter into them, or to consummate the transactions contemplated hereby or thereby; or (iii) to the Company's knowledge, that would reasonably be expected to have, either individually or in the aggregate, a Material Adverse Effect. Neither the Company nor, to the Company's knowledge, any of its officers, directors or Key Employees is a party or is named as subject to the provisions of any order, writ, injunction, judgment or decree of any court or government agency or instrumentality (in the case of officers, directors or Key Employees, such as would affect the Company). There is no action, suit, proceeding or investigation by the Company pending or which the Company intends to initiate. The foregoing includes, without limitation, actions, suits, proceedings or investigations pending or threatened in writing (or any basis therefor known to the Company) involving the prior employment of any of the Company's employees, their services provided in connection with the Company's business, any information or techniques allegedly proprietary to any of their former employers or their obligations under any agreements with prior employers.

4.8 Intellectual Property. The Company owns or possesses or can acquire on commercially reasonable terms sufficient legal rights to all Company Intellectual Property without any known conflict with, or infringement of, the rights of others, including prior employees or consultants, or academic or medical institutions with which any of them may be affiliated now or may have been affiliated in the past. To the Company's knowledge, no product or service marketed or sold (or proposed to be marketed or sold) by the Company violates or will violate any license or infringes or will infringe any intellectual property rights of any other party in the absence of a license to such intellectual property rights. Other than with respect to the Takeda Agreements or commercially available software products under standard end-user object code license agreements, there are no outstanding options, licenses, agreements, claims, encumbrances or shared ownership interests of any kind relating to the Company Intellectual Property, nor is the Company bound by or a party to any options, licenses or agreements of any kind with respect to the patents, trademarks, service marks, trade names, copyrights, trade secrets, licenses, information, proprietary rights and processes of any other Person. The Company has not received any communications alleging that the Company has infringed, or by conducting its business, would infringe any of the patents, trademarks, service marks, tradenames, copyrights, trade secrets, mask works or other proprietary rights or processes of any other Person. To the Company's knowledge, no third party is infringing any of the Company Intellectual Property. The Company has obtained and possesses valid licenses to use all of the software programs present on the computers and other software-enabled electronic devices that it owns or leases or that it has otherwise provided to its employees for their use in connection with the Company's business. To the Company's knowledge, it will not be necessary to use any inventions of any of its employees or consultants (or Persons it currently intends to hire) made prior to their employment by the Company that are not otherwise the subject of the Takeda Agreements, including prior employees or consultants, or academic or medical institutions with which any of them may be affiliated now or may have been affiliated in the past. Each employee and consultant has assigned to the Company all intellectual property rights that he, she or it solely or jointly conceived, reduced to practice, developed or made during the period of his, her or its employment or consulting relationship with the Company that (a) relate, at the time of conception, reduction to practice, development, or making of such intellectual property right, to the Company's business as then conducted or as then proposed to be conducted, (b) were developed on any amount of the Company's time or with the use of any of the Company's equipment, supplies, facilities or information or (c) resulted from the performance of services for the Company. Section 4.8 of the Disclosure Schedule lists all patents, patent applications, registered trademarks, trademark applications, service marks, service mark applications, tradenames, registered copyrights, and licenses to and under any of the foregoing, in each case owned by the Company. The Company has not embedded any open source, copyleft or community source code in any of its products generally available or in development, including but not limited to any libraries or code licensed under any General Public License, Lesser General Public License or similar license arrangement. For purposes of this Section 4.8, the Company shall be deemed to have knowledge of a patent right if the Company has actual knowledge of the patent right or would be found to be on notice of such patent right as determined by reference to United States patent laws. No government funding, facilities of a university, college, other educational institution or research center, was used in the development

of any Company Intellectual Property that is owned by the Company. To the Company's knowledge, no Person who was involved in, or who contributed to, the creation or development of any Company Intellectual Property, has performed services for the government, university, college, or other educational institution or research center in a manner that would adversely affect the Company's rights in the Company Intellectual Property.

4.9 Property. The property and assets that the Company owns are free and clear of all mortgages, deeds of trust, liens, loans and encumbrances, except for statutory liens for the payment of current taxes that are not yet delinquent and encumbrances and liens that arise in the ordinary course of business and do not materially impair the Company's ownership or use of such property or assets. With respect to the property and assets it leases, the Company is in compliance with such leases and holds a valid leasehold interest free of any liens, claims or encumbrances other than those of the lessors of such property or assets. The Company does not own any real property.

4.10 Absence of Undisclosed Liabilities. The Company does not have any liability or obligation of any nature, whether accrued, absolute, contingent or otherwise, asserted or unasserted, known or unknown, in any case which has, or is reasonably likely to have, a Material Adverse Effect. The Company has not assumed, guaranteed, endorsed or otherwise become directly or contingently liable on or for any indebtedness of any other Person.

4.11 Valid Issuance of Conversion Shares. The Conversion Shares to be issued, sold and delivered upon conversion of the Notes and any shares of Common Stock issued or issuable in respect thereof, will be duly and validly issued, fully paid and nonassessable and, based in part upon the representations and warranties of the Lenders in this Agreement, will be issued in compliance with all applicable federal and state securities laws.

4.12 Committee on Foreign Investment. The Company is not currently a U.S. business that produces, designs, tests, manufactures, fabricates, or develops a critical technology that is (a) utilized in connection with the U.S. business's activity in one or more pilot program industries, or (b) designed by the U.S. business specifically for use in one or more pilot program industries, as these terms are defined at 31 C.F.R. Parts 800 and 801.

4.13 Disclosure. The Company has made available to the Lenders all the information reasonably available to the Company that the Lenders have requested for deciding whether to purchase the Notes. No representation or warranty of the Company contained in this Agreement, as qualified by the Disclosure Schedule, and no certificate furnished or to be furnished to the Lenders at the Initial Closing contains any untrue statement of a material fact or, to the Company's knowledge, omits to state a material fact necessary in order to make the statements contained herein or therein not misleading in light of the circumstances under which they were made. It is understood that this representation is qualified by the fact that the Company has not delivered to the Lenders, and has not been requested to deliver, a private placement or similar memorandum or any written disclosure of the types of information customarily furnished to purchasers of securities.

5. Representations, Warranties and Additional Agreements of the Lenders.

5.1 Representations and Warranties of the Lenders. In connection with the transactions provided for herein, each Lender hereby represents and warrants to the Company that:

(a) Authorization. This Agreement constitutes such Lender's valid and legally binding obligation, enforceable in accordance with its terms, except as may be limited by (i) applicable bankruptcy, insolvency, reorganization, or similar laws relating to or affecting the enforcement of creditors' rights and (ii) laws relating to the availability of specific performance, injunctive relief or other equitable remedies. Each Lender represents that it has full power and authority to enter into this Agreement.

(b) Purchase Entirely for Own Account. Each Lender acknowledges that this Agreement is made with Lender in reliance upon such Lender's representation to the Company that the Notes, the Conversion Shares, and any Common Stock issuable, directly or indirectly, upon conversion of the Conversion Shares (collectively, the "Securities") will be acquired for investment for Lender's own account, not as a nominee or agent, and not with a view to the resale or distribution of any part thereof, and that such Lender has no present intention of selling, granting any participation in, or otherwise distributing the same. By executing this Agreement, each Lender further represents that such Lender does not have any contract, undertaking, agreement or arrangement with any person to sell, transfer or grant participations to such person or to any third person, with respect to the Securities.

(c) Disclosure of Information. Each Lender acknowledges that it has received all the information it considers necessary or appropriate for deciding whether to acquire the Securities. Each Lender further represents that it has had an opportunity to ask questions and receive answers from the Company regarding the terms and conditions of the offering of the Securities.

(d) Investment Experience. Each Lender is an investor in securities of companies in the development stage and acknowledges that it is able to fend for itself, can bear the economic risk of its investment and has such knowledge and experience in financial or business matters that it is capable of evaluating the merits and risks of the investment in the Securities. If other than an individual, each Lender also represents it has not been organized solely for the purpose of acquiring the Securities.

(e) Accredited Investor. Each Lender is an "accredited investor" within the meaning of Rule 501 of Regulation D promulgated under the Securities Act, as presently in effect ("Rule 501"). If such Lender has been organized for the purpose of acquiring the Securities, each holder of securities of such Lender, or holder of any right to acquire such securities or any of the Securities, is an "accredited investor" pursuant to Rule 501.

(f) Restricted Securities. Each Lender understands that the Securities are characterized as "restricted securities" under the federal securities laws inasmuch as they are being acquired from the Company in a transaction not involving a public offering and that under such laws and applicable regulations such securities may be resold without registration under the

Securities Act only in certain limited circumstances. Each Lender represents that it is familiar with Rule 144 and understands the resale limitations imposed thereby and by the Securities Act.

5.2 Further Limitations on Disposition. Without in any way limiting the representations and warranties set forth above, each Lender further agrees not to make any disposition of all or any portion of the Securities unless and until the transferee has agreed in writing for the benefit of the Company to be bound by this Section 5 and Section 8.11 and the transferring Lender has notified the Company of the proposed disposition and has furnished the Company with a detailed statement of the circumstances surrounding the proposed disposition. It is agreed that the Company will not require opinions of counsel for transactions made pursuant to Rule 144.

Lender shall not make any disposition of any of the Securities to any person that would result in the Company being ineligible to rely on Rule 506 of Regulation D in regards to the issuance of the Securities or any subsequent issuance of securities of the Company, as such in either case is in good faith determined by the Company.

Notwithstanding anything herein to the contrary, each Lender may freely transfer the Securities to its Affiliates without restriction.

5.3 Legends. It is understood that the Securities may bear the following legend:

"THESE SECURITIES HAVE NOT BEEN REGISTERED UNDER THE SECURITIES ACT OF 1933, AS AMENDED (THE "ACT"). THEY MAY NOT BE SOLD, OFFERED FOR SALE, PLEDGED, HYPOTHECATED, OR OTHERWISE TRANSFERRED EXCEPT PURSUANT TO AN EFFECTIVE REGISTRATION STATEMENT UNDER THE ACT OF 1933 OR SUCH TRANSFER IS EXEMPT FROM THE REGISTRATION AND PROSPECTUS DELIVERY REQUIREMENTS OF SAID ACT."

5.4 Bad Actor Representations and Covenants. Each Lender that is among the Persons identified in Rule 506(d)(1) of Regulation D (a "**Covered Person**") hereby represents and warrants to the Company that such Lender has not been convicted of any of the felonies or misdemeanors or has been subject to any of the orders, judgments, decrees or other conditions set forth in Rule 506(d) of Regulation D promulgated by the SEC, which are excerpted in their current form on Exhibit B. Each Lender covenants that if it is then a Covered Person to provide immediate written notice to the Company in the event such Lender is convicted of any felony or misdemeanor or becomes subject to any order, judgment, decree or other condition set forth in Rule 506(d) of Regulation D promulgated by the SEC, as may be amended from time to time. Each Lender covenants to provide such information to the Company as the Company may reasonably request in order to comply with the disclosure obligations set forth in Rule 506(e) of Regulation D promulgated by the SEC, as may be amended from time to time.

5.5 Exculpation Among Lenders. Each Lender acknowledges that it is not relying upon any person, firm or corporation, other than the Company, in making its

investment or decision to invest in the Company. Each Lender agrees that no Lender nor the respective controlling persons, officers, directors, partners, agents, or employees of any Lender shall be liable to any other Lender for any action heretofore or hereafter taken or omitted to be taken by any of them in connection with the purchase of the Securities.

6. Defaults and Remedies.

6.1 Events of Default. Any of the following events shall be considered an "Event of Default" with respect to each Note:

(a) The Company shall default in the payment of any part of the principal or unpaid accrued interest on the Note, (i) for more than two (2) days after demand for payment therefor by the Requisite Noteholders following the Note becoming due and payable pursuant to the terms and conditions of the Notes, or (ii) after a date fixed by acceleration or otherwise;

(b) The Company shall make an assignment for the benefit of creditors, or shall admit in writing its inability to pay its debts as they become due, or shall file a voluntary petition for bankruptcy, or shall file any petition or answer seeking for itself any reorganization, arrangement, composition, readjustment, dissolution or similar relief under any present or future statute, law or regulation, or shall file any answer admitting the material allegations of a petition filed against the Company in any such proceeding, or shall seek or consent to or acquiesce in the appointment of any trustee, receiver or liquidator of the Company, or of all or any substantial part of the properties of the Company, or the Company or its respective directors or majority stockholders shall take any action looking to the dissolution or liquidation of the Company;

(c) Within thirty (30) days after the commencement of any proceeding against the Company seeking any bankruptcy reorganization, arrangement, composition, readjustment, liquidation, dissolution or similar relief under any present or future statute, law or regulation, such proceeding shall not have been dismissed, or within thirty (30) days after the appointment without the consent or acquiescence of the Company of any trustee, receiver or liquidator of the Company or of all or any substantial part of the properties of the Company, such appointment shall not have been vacated;

(d) Within thirty (30) days after the Company becomes involved in litigation that threatens to materially and adversely affect the Company's business, operations, assets, results of operations or prospects, if the Company's involvement has not terminated by such date in a manner that does not and could not reasonably be expected to materially and adversely affect the Company's business, operations, assets, results of operations or prospects;

(e) Any default or defined event of default that has not otherwise been cured or forgiven within fifteen (15) days after written notice to the Company from the applicable lender of such default or defined event of default shall occur under any agreement to which the Company is a party that evidences indebtedness for borrowed money by the Company (excluding trade payables) of $50,000 or more; or

(f) The Company shall fail to observe or perform any other obligation to be observed or performed by it under this Agreement or the Notes within fifteen (15) days after written notice from the Requisite Noteholders to perform or observe such obligation.

6.2 Remedies. Upon the occurrence of an Event of Default under Section 6.1 hereof, at the option and upon the declaration of the majority in interest of the aggregate outstanding principal amount of the Notes, the entire unpaid principal and accrued and unpaid interest on the Notes shall, without presentment, demand, protest, or notice of any kind, all of which are hereby expressly waived, be forthwith due and payable, and such Requisite Noteholders may, immediately and without expiration of any period of grace, enforce payment of all amounts due and owing under such Notes and exercise any and all other remedies granted to them at law, in equity or otherwise.

7. Covenants of the Company; Rights of the Holders of the Notes.

7.1 Delivery of Financial Statements; Inspection Rights.

(a) The Company shall deliver to each Lender:

(i) as soon as practicable, but in any event within one hundred twenty (120) days after the end of each fiscal year of the Company, an income statement for such fiscal year and a balance sheet of the Company, and a statement of cash flows for such year, such year-end financial reports to be in reasonable detail, prepared in accordance with generally accepted accounting principles ("GAAP"), and audited and certified by independent public accountants of nationally recognized standing selected by the Company;

(ii) as soon as practicable, but in any event within forty-five (45) days after the end of each of the first three (3) quarters of each fiscal year of the Company, an unaudited income statement and statement of cash flows for such fiscal quarter and an unaudited balance sheet as of the end of such fiscal quarter, all prepared in accordance with GAAP (except that such financial statements may (A) be subject to normal year-end audit adjustments and (B) not contain all notes thereto that may be required in accordance with GAAP);

(iii) as soon as practicable, but in any event at least thirty (30) days prior to the end of each fiscal year, a budget and business plan for the next fiscal year, prepared on a monthly basis, including balance sheets, income statements and statements of cash flows for such months and, as soon as prepared, any other budgets or revised budgets prepared by the Company;

(iv) as soon as practicable, but in any event within thirty (30) days after the end of each fiscal year of the Company, a statement showing the number of shares of each class and series of capital stock and securities convertible into or exercisable for shares of capital stock outstanding at the end of the period, the Common Stock issuable upon conversion or exercise of any outstanding securities convertible or exercisable for Common Stock and the exchange ratio or exercise price applicable thereto, and the number of shares of issued stock options and stock options not yet issued but reserved for issuance, if any, all in

sufficient detail as to permit the Lenders to calculate their respective percentage ownership in the Company;

(v) such other information relating to the financial condition, business or corporate affairs of the Company as the Requisite Noteholders may from time to time reasonably request; provided, however, that the Company shall not be obligated under this subsection (iv) or any other subsection of Section 7.1 to provide information that (A) it deems in good faith to be a trade secret or similar highly sensitive confidential information or (B) the disclosure of which would adversely affect the attorney-client privilege between the Company and its counsel; and

(b) Notwithstanding anything else in this Section 7.1 to the contrary, the Company may cease providing the information set forth in this Section 7.1 during the period starting with the date thirty (30) days before the Company's good-faith estimate of the date of filing of a registration statement if it reasonably concludes it must do so to comply with the SEC rules applicable to such registration statement and related offering; provided that the Company's covenants under this Section 7.1 shall be reinstated at such time as the Company is no longer actively employing its commercially reasonable efforts to cause such registration statement to become effective.

(c) Inspection. The Company shall permit each Lender, at such Lender's expense, to visit and inspect the Company's properties, to examine its books of account and records and to discuss the Company's affairs, finances and accounts with its officers, all at such reasonable times as may be requested by the Lender; provided, however, that the Company shall not be obligated pursuant to this Section 7.1 to provide access to any information that (A) it deems in good faith to be a trade secret or similar confidential information or (B) the disclosure of which would adversely affect the attorney-client privilege between the Company and its counsel.

(d) Termination of Information and Inspection Covenants. The covenants set forth in Sections 7.1(a) and 7.1(c) shall terminate and be of no further force or effect upon the earlier to occur of (i) the consummation of the Initial Public Offering, (ii) when the Company first becomes subject to the periodic reporting requirements of Sections 12(g) or 15(d) of the Exchange Act, whichever event shall first occur, (iii) the Next Equity Financing, (iv) a Non-Qualified Next Equity Financing into which such Lender's Note converts and (v) the consummation of a Corporate Transaction; provided in the case of (iii) or (iv), the Lender receives similar rights under the applicable financing documents for such transaction, and in the case of (v), that the consideration received is either (A) cash or (B) securities of a company registered under, and in compliance with its obligations under the Exchange Act.

7.2 Right of First Offer. Subject to the terms and conditions specified in this Section 7.2, the Company hereby grants to Takeda and each Lender a right of first offer with respect to future sales by the Company of its Shares (as hereinafter defined). For purposes of this Section 7.2, the term "Lender" includes any general partners and Affiliates of a Lender. Takeda and each Lender shall be entitled to apportion the right of first offer hereby granted it among itself and its partners and Affiliates in such proportions as it deems appropriate.

Each time the Company proposes to offer any shares of, or securities convertible into or exchangeable or exercisable for any shares of, its capital stock (including, without limitation, any such shares or securities issued in connection with debt securities) ("Shares"), the Company shall first make an offering of such Shares to Takeda and each Lender in accordance with the following provisions:

(a) The Company shall deliver a notice in accordance with Section 8.5 ("Notice") to Takeda and the Lenders stating (i) its bona fide intention to offer such Shares, (ii) the number of such Shares to be offered and (iii) the price and terms upon which it proposes to offer such Shares.

(b) By written notification received by the Company within ten (10) calendar days after the giving of Notice, Takeda and each Lender may elect to purchase, at the price and on the terms specified in the Notice, up to that portion of such Shares that equals the following: (i) with respect to Takeda, fifteen percent (15%) of such Shares; and (ii) with respect to each Lender, such Lender's respective pro rata portion of eighty five (85%) of such Shares determined in the proportion that the principal outstanding under the Note(s) held by such Lender bears to the total principal outstanding under the Notes held by all the Lenders; provided, that if Takeda does not elect to purchase the full amount of Shares to which it is entitled to purchase under this Section 7.2(b)(i), then each Lender shall have a right to elect to purchase its pro rata portion of any such remaining Shares not purchased by Takeda pursuant to the provisions of this Section 7.2(b)(ii).

(c) If all Shares that Takeda and the Lenders are entitled to obtain pursuant to Section 7.2(b) of this Agreement are not elected to be obtained as provided in Section 7.2(b) of this Agreement, the Company may, during the ninety (90) day period following the expiration of the period provided in Section 7.2(b) of this Agreement, offer the remaining unsubscribed portion of such Shares to any Person or Persons at a price not less than that, and upon terms no more favorable to the offeree than those, specified in the Notice. If the Company does not enter into an agreement for the sale of the Shares within such period, or if such agreement is not consummated within sixty (60) days of the execution thereof, the right provided hereunder shall be deemed to be revived and such Shares shall not be offered unless first reoffered to Takeda and the Lenders in accordance herewith.

(d) The right of first offer in this Section 7.2 shall not be applicable to (i) the issuance or sale of shares of Common Stock (or options therefor) (appropriately adjusted for any stock split, dividend, combination or other recapitalization) to employees, directors, consultants and other service providers for the primary purpose of soliciting or retaining their services pursuant to plans or agreements approved by the Board; (ii) the issuance of securities in the Initial Public Offering; (iii) the issuance of securities pursuant to the conversion or exercise of convertible or exercisable securities; (iv) the issuance of securities in connection with a bona fide business acquisition by the Company, whether by merger, consolidation, sale of assets, sale or exchange of stock or otherwise; (v) the issuance and sale of Conversion Shares; or (vi) the issuance of stock, warrants or other securities or rights pursuant to any equipment leasing arrangement or debt financing arrangement; provided such issuances are approved by the Board and (except for the Initial Public Offering) are primarily for non-equity financing purposes. In addition to the foregoing, the right of first offer in this Section 7.2 shall not be applicable with

respect to any Lender in any subsequent offering of Shares if (i) at the time of such offering, the Lender is not an "accredited investor," as that term is then defined in Rule 501(a) of the Securities Act and (ii) such offering of Shares is otherwise being offered only to accredited investors.

(e) The rights provided in this Section 7.2 may not be assigned or transferred by any Lender; provided, however, that a Lender that is a venture capital fund, private equity investor or investment advisor may assign or transfer such rights to its Affiliates.

(f) The right of first offer in this Section 7.2, including notice with respect thereto, may be waived by Takeda with the written consent of Takeda. The right of first offer in this Section 7.2, including notice with respect thereto, may be waived by all Lenders with the written consent of the Requisite Noteholders. Takeda's and the Requisite Noteholders' right to waive the provisions of this Section 7.2 shall be independent of one another.

(g) The covenants set forth in this Section 7.2 shall terminate and be of no further force or effect upon (i) the consummation of the Initial Public Offering, (ii) when the Company first becomes subject to the periodic reporting requirements of Sections 12(g) or 15(d) of the Exchange Act and (iii) upon the consummation of a Corporate Transaction, whichever event shall first occur.

7.3 Rights of Refusal.

(a) Transfer Notice. If at any time a Common Holder proposes to Transfer Equity Securities (a "Selling Common Holder"), then the Selling Common Holder shall promptly give the Company and each Lender written notice of the Selling Common Holder's intention to make the Transfer (the "Transfer Notice"). The Transfer Notice shall include (i) a description of the Equity Securities to be transferred (the "Offered Shares"), (ii) the name(s) and address(es) of the prospective transferee(s), (iii) the purchase price and form of consideration proposed to be paid for the Offered Shares and (iv) the other material terms and conditions upon which the proposed Transfer is to be made. The Transfer Notice shall certify that the Selling Common Holder has received a firm offer from the prospective transferee(s) and in good faith believes a binding agreement for the Transfer is obtainable on the terms set forth in the Transfer Notice. The Transfer Notice shall also include a copy of any written proposal, term sheet or letter of intent or other agreement relating to the proposed Transfer. In the event that the transfer is being made pursuant to the provisions of Section 7.3, the Transfer Notice shall state under which specific clause of Section 7.3 the Transfer is being made.

(b) Company's Right of First Refusal. The Company shall have an option for a period of ten (10) days from delivery of the Transfer Notice in accordance with Section 8.5 to elect to purchase the Offered Shares at the same price and subject to the same material terms and conditions as described in the Transfer Notice. The Company may exercise such purchase option and purchase all or any portion of the Offered Shares by notifying the Selling Common Holder in writing before expiration of such ten (10) day period as to the number of such shares that it wishes to purchase. If the Company gives the Selling Common Holder notice that it desires to purchase such shares, then payment for the Offered Shares shall be made by check or wire transfer against delivery of the Offered Shares to be purchased at a

time and place agreed upon between the parties, which time shall be no later than forty-five (45) days after delivery to the Company of the Transfer Notice in accordance with Section 8.5, unless the Transfer Notice contemplated a later closing with the prospective third-party transferee(s) or unless the value of the consideration to be paid for the Offered Shares has not yet been established pursuant to Section 7.3(e)(ii). If the Company fails to purchase any or all of the Offered Shares by exercising the option granted in this Section 7.3(b) within the period provided, the remaining Offered Shares shall be subject to the options granted to the Lenders pursuant to Section 7.3(d).

(c) Additional Transfer Notice. Subject to the Company's option set forth in Section 7.3(b), if at any time the Selling Common Holder proposes a Transfer, then, within five (5) days after the Company has declined to purchase all, or a portion, of the Offered Shares or the Company's option to so purchase the Offered Shares has expired, the Selling Common Holder shall give each Lender an "Additional Transfer Notice" that shall include all of the information and certifications required in a Transfer Notice and shall additionally identify the Offered Shares that the Company has declined to purchase (the "Remaining Shares") and reference the Lenders' rights of first refusal with respect to the proposed Transfer contained in this Agreement.

(d) Lenders' Right of First Refusal.

(i) Each Lender shall have an option for a period of fifteen (15) days from the delivery of the Additional Transfer Notice in accordance with Section 8.5 from the Selling Common Holder set forth in Section 7.3(c) to elect to purchase its respective pro rata share of the Remaining Shares at the same price and subject to the same material terms and conditions as described in the Additional Transfer Notice. Each Lender may exercise such purchase option and purchase all or any portion of its pro rata share of the Remaining Shares (a "Participating Lender" for the purposes of this Section 7.3(d) and Section 7.3(e)), by notifying the Selling Common Holder and the Company in writing, before expiration of the fifteen (15)-day period as to the number of such shares that it wishes to purchase (the "Participating Lender Notice"). Each Lender's pro rata share of the Remaining Shares shall be a fraction of the Remaining Shares, the numerator of which shall be the number of shares of Common Stock either already issued or issuable, directly or indirectly, upon conversion of the Notes owned by such Lender on the date of the Transfer Notice and denominator of which shall be the total number of shares of Common Stock either already issued or issuable, directly or indirectly, upon conversion of the Notes held by all Lenders on the date of the Transfer Notice.

(ii) In the event any Lender elects not to purchase its pro rata share of the Remaining Shares available pursuant to its option under Section 7.3(d)(i) within the time period set forth therein, then the Selling Common Holder shall promptly give written notice (the "Overallotment Notice") to each Participating Lender that has elected to purchase all of its pro rata share of the Remaining Shares (each a "Fully Participating Lender"), which notice shall set forth the number of Remaining Shares not purchased by the other Lenders ("Unsubscribed Shares"), and shall offer the Fully Participating Lenders the right to acquire the Unsubscribed Shares. Each Fully Participating Lender shall have five (5) days after delivery of the Overallotment Notice in accordance with Section 8.5 to deliver a written notice to the Selling Common Holder (the "Participating Lenders Overallotment Notice") of its election to purchase

its pro rata share of the Unsubscribed Shares on the same terms and conditions as set forth in the Additional Transfer Notice, which such Participating Lenders Overallotment Notice shall also indicate the maximum number of the Unsubscribed Shares that such Fully Participating Lender will purchase in the event that any other Fully Participating Lender elects not to purchase its pro rata share of the Unsubscribed Shares. For the purposes of determining a Fully Participating Lender's pro rata share of the unsubscribed shares under this Section 7.3(d)(ii), the numerator shall be the same as that used in Section 7.3(d)(i) above and the denominator shall be the total number of shares of Common Stock (including shares of Common Stock issuable, directly or indirectly, upon conversion of the Notes) owned by all Fully Participating Lenders on the date of the Transfer Notice.

(iii) Each Participating Lender shall be entitled to apportion Remaining Shares to be purchased among its partners and Affiliates, provided that such Participating Lender notifies the Selling Common Holder of such allocation.

(e) Payment.

(i) The Participating Lenders shall effect the purchase of the Remaining Shares with payment by check or wire transfer against delivery of the Remaining Shares to be purchased at a time and place agreed upon between the parties, which time shall be no later than sixty (60) days after delivery to the Company of the Transfer Notice in accordance with Section 8.5, unless the Transfer Notice contemplated a later closing with the prospective third-party transferee(s) or unless the value of the consideration to be paid for the Offered Shares has not yet been established pursuant to Section 7.3(e)(ii).

(ii) Should the purchase price specified in the Transfer Notice or Additional Transfer Notice be payable in a form of consideration other than cash or evidences of indebtedness, the Company (and the Participating Lenders) shall have the right to pay such purchase price in an amount of cash equal to the fair market value of such consideration. If the Selling Common Holder and the Company (or the Participating Lenders) cannot agree on such fair market value within ten (10) days after delivery to the Company of the Transfer Notice (or the delivery of the Additional Transfer Notice to the Lenders), the valuation shall be made by an appraiser of recognized standing selected by the Selling Common Holder and the Company (or a majority-in-interest of the Participating Lenders) or, if they cannot agree on an appraiser within twenty (20) days after delivery to the Company of the Transfer Notice (or the delivery of the Additional Transfer Notice to the Lenders), each shall select an appraiser of recognized standing and those appraisers shall designate a third appraiser of recognized standing, whose appraisal shall be determinative of such value. The cost of such appraisal shall be shared equally by the Selling Common Holder, on the one hand, and the Company (and, to the extent there are any, the Participating Lenders, on the other hand, with that half of the cost to be borne by the Company and the Participating Lenders to be apportioned on a pro rata basis based on the number of shares each such party has expressed an interest in purchasing pursuant to this Section 7.3). If the time for the closing of the Company's purchase or the Participating Lenders' purchase has expired but the determination of the value of the purchase price offered by the prospective transferee(s) has not been finalized, then such closing shall be held on or prior to the fifth business day after such valuation shall have been made pursuant to this Section 7.3(e)(ii).

7.4 Drag Along Right.

(a) Actions to be Taken. In the event that the Board, the holders of a majority of the outstanding shares of Common Stock, including the affirmative approval of Frazier, and the Requisite Noteholders (the "Requisite Parties"), approve a Sale of the Company, then each Common Holder, Takeda and Frazier hereby agrees with respect to all Shares which it own(s) or over which it otherwise exercises voting or dispositive authority:

(i) in the event such transaction is to be brought to a vote at a stockholder meeting, after receiving proper notice of any meeting of stockholders of the Company, to vote on the approval of a Sale of the Company, to be present, in person or by proxy, as a holder of shares of voting securities, at all such meetings and be counted for the purposes of determining the presence of a quorum at such meetings;

(ii) to vote (in person, by proxy or by action by written consent, as applicable) all Shares in favor of such Sale of the Company and in opposition to any and all other proposals that could reasonably be expected to delay or impair the ability of the Company to consummate such Sale of the Company;

(iii) to refrain from exercising any dissenters' rights or rights of appraisal under applicable law at any time with respect to such Sale of the Company;

(iv) to execute and deliver all related documentation and take such other action in support of the Sale of the Company as shall reasonably be requested by the Company or the Requisite Parties;

(v) if the Sale of the Company is structured as a Stock Sale, to sell the same proportion of his, her or its Shares as is being sold by the Requisite Parties, and, except as permitted in Section 7.4(b) below, on the same terms and conditions as the Requisite Parties;

(vi) not to deposit, and to cause their affiliates not to deposit, except as provided in this Agreement, any Shares owned by such Common Holder, Takeda and Frazier or any of their Affiliates in a voting trust or subject any such Shares to any arrangement or agreement with respect to the voting of such Shares, unless specifically requested to do so by the acquirer in connection with the Sale of the Company; and

(vii) if the consideration to be paid in exchange for the Shares pursuant to this Section 7.4 includes any securities and due receipt thereof by any stockholder would require under applicable law (i) the registration or qualification of such securities or of any person as a broker or dealer or agent with respect to such securities or (ii) the provision to any Common Holder, Takeda and Frazier of any information other than such information as a prudent issuer would generally furnish in an offering made solely to "accredited investors" as defined in Regulation D promulgated under the Securities Act, the Company may cause to be paid to any such Common Holder, Takeda and Frazier in lieu thereof, against surrender of the Shares which would have otherwise been sold by such stockholder, an amount in cash equal to the fair value (as determined in good faith by the Company) of the securities which such

Common Holder, Takeda and Frazier would otherwise receive as of the date of the issuance of such securities in exchange for the Shares.

(b) Exceptions. Notwithstanding the foregoing, each Common Holder, Takeda, Frazier and any holder of Common Stock issued upon the conversion of the Notes in accordance with the provisions of this Agreement will not be required to comply with Section 7.4(a) above in connection with any proposed Sale of the Company (the "Proposed Sale") unless:

(i) any representations and warranties to be made by such Common Holder, Takeda and Frazier in connection with the Proposed Sale are limited to representations and warranties related to authority, ownership and the ability to convey title to such Common Holder's, Takeda's and Frazier's Shares, including, without limitation, representations and warranties that (i) the Common Holder, Takeda and Frazier holds all right, title and interest in and to the Shares such stockholder purports to hold, free and clear of all liens and encumbrances, (ii) the obligations of the Common Holder, Takeda and Frazier in connection with the transaction have been duly authorized, if applicable, (iii) the documents to be entered into by the stockholder have been duly executed by the Common Holder, Takeda and Frazier and delivered to the acquiror and are enforceable against the stockholder in accordance with their respective terms and (iv) neither the execution and delivery of documents to be entered into in connection with the transaction, nor the performance of the Common Holder's, Takeda's and Frazier's obligations thereunder, will cause a breach or violation of the terms of any agreement, law or judgment, order or decree of any court or governmental agency by which such stockholder is subject or bound;

(ii) the Common Holder, Takeda and Frazier shall not be liable for the inaccuracy of any representation or warranty made by any other person in connection with the Proposed Sale, other than the Company (except to the extent that funds may be paid out of an escrow established to cover breach of representations, warranties and covenants of the Company as well as breach by any stockholder of any identical representations, warranties and covenants provided by all stockholders);

(iii) the liability for indemnification, if any, of such Common Holder, Takeda and Frazier in the Proposed Sale and for the inaccuracy of any representations and warranties made by the Company in connection with such Proposed Sale, is several and not joint with any other person (except to the extent that funds may be paid out of an escrow established to cover breach of representations, warranties and covenants of the Company as well as breach by any stockholder of any identical representations, warranties and covenants provided by all stockholders), and is pro rata in proportion to the amount of consideration paid to such Common Holder, Takeda and Frazier in connection with such Proposed Sale (in accordance with the provisions of the Company's Certificate of Incorporation);

(iv) liability shall be limited to such Common Holder's, Takeda's and Frazier's applicable share (determined based on the respective proceeds payable to each stockholder in connection with such Proposed Sale in accordance with the provisions of the Company's Certificate of Incorporation) of a negotiated aggregate indemnification amount that applies equally to all Common Holder, Takeda and Frazier but that in no event exceeds the

amount of consideration otherwise payable to such Common Holder, Takeda and Frazier in connection with such Proposed Sale, except with respect to claims related to fraud by such Common Holder, Takeda and Frazier, the liability for which need not be limited as to such Common Holder, Takeda and Frazier;

(v) upon the consummation of the Proposed Sale, (A) each holder of each class or series of the Company's stock will receive the same form of consideration for their shares of such class or series as is received by other holders in respect of their shares of such same class or series of stock, (B) each holder of a series of Preferred Stock will receive the same amount of consideration per share of such series of Preferred Stock as is received by other holders in respect of their shares of such same series, (C) each holder of Common Stock will receive the same amount of consideration per share of Common Stock as is received by other holders in respect of their shares of Common Stock, and (D) the aggregate consideration receivable by all holders of the Preferred Stock and Common Stock shall be allocated among the holders of Preferred Stock and Common Stock on the basis of the relative liquidation preferences to which the holders of each respective series of Preferred Stock and the holders of Common Stock are entitled in a Corporate Transaction (assuming for this purpose that the Proposed Sale is a Corporate Transaction) in accordance with the Company's Certificate of Incorporation in effect immediately prior to the Proposed Sale;

(vi) subject to subsection 7.4(b)(v) above, requiring the same form of consideration to be available to the holders of any single class or series of capital stock, if any holders of a series or class of capital stock of the Company are given an option as to the form and amount of consideration to be received as a result of the Proposed Sale, all holders of such series or class of capital stock will be given the same option; provided, however, that nothing in this subsection 7.4(b)(vi) shall entitle any holder to receive any form of consideration that such holder would be ineligible to receive as a result of such holder's failure to satisfy any condition, requirement or limitation that is generally applicable to the Company's stockholders;

(vii) no Common Holder that previously was a Lender shall be required to agree to any covenant not to compete or covenant not to solicit customers, employees or suppliers of any party to the Proposed Sale, or any obligation to provide services to the Company, the Person or group of related Persons participating in the Proposed Sale, or any other Person;

(viii) such Common Holder (unless such Common Holder is a Company officer or employee), Takeda and Frazier are not required to agree to any restrictive covenant in connection with the Proposed Sale (including without limitation any covenant not to compete or covenant not to solicit customers, employees or suppliers of any party to the Proposed Sale); and

(ix) such Common Holder, Takeda and Frazier and their Affiliates are not required to amend, extend or terminate any contractual or other relationship with the Company, the acquirer or their respective Affiliates, except that such Common Holder, Takeda and Frazier may be required to agree to terminate the investment-related documents between or among such Common Holder, Takeda or Frazier, the Company and/or other stockholders of the Company.

7.5 Registration Rights. The Company covenants and agrees as follows:

(a) Request for Registration.

(i) Subject to the conditions of this Section 7.5(a), if the Company shall receive at any time, a written request from the Holders of at least twenty-five percent (25%) of the holders of Registrable Securities then outstanding (for purposes of this Section 7.5(a), the "Initiating Holders") that the Company file a registration statement under the Securities Act covering the registration of Registrable Securities with an anticipated aggregate offering price of at least $10,000,000, then the Company shall, within twenty (20) days of the receipt thereof, give written notice of such request to all Lenders, and subject to the limitations of this Section 7.5(a), use its commercially reasonable efforts to effect, as soon as practicable, the registration under the Securities Act of all Registrable Securities that the Holders request to be registered in a written request received by the Company within twenty (20) days of the mailing of the Company's notice pursuant to this Section 7.5(a)(i).

(ii) If the Initiating Holders intend to distribute the Registrable Securities covered by their request by means of an underwriting, they shall so advise the Company as a part of their request made pursuant to this Section 7.5(a), and the Company shall include such information in the written notice referred to in Section 7.5(a)(i). In such event the right of any Holder to include its Registrable Securities in such registration shall be conditioned upon such Holder's participation in such underwriting and the inclusion of such Holder's Registrable Securities in the underwriting (unless otherwise mutually agreed by a majority in interest of the Initiating Holders and such Holder) to the extent provided herein. All Holders proposing to distribute their securities through such underwriting shall enter into an underwriting agreement in customary form with the underwriter or underwriters selected for such underwriting by the Company (which underwriter or underwriters shall be reasonably acceptable to those Initiating Holders holding a majority of the Registrable Securities then held by all Initiating Holders). Notwithstanding any other provision of this Section 7.5(a), if the underwriter advises the Company that marketing factors require a limitation on the number of securities underwritten (including Registrable Securities), then the Company shall so advise all Holders of Registrable Securities that would otherwise be underwritten pursuant hereto, and the number of shares that may be included in the underwriting shall be allocated to the Holders of such Registrable Securities pro rata based on the number of Registrable Securities held by all such Holders (including the Initiating Holders). In no event shall any Registrable Securities be excluded from such underwriting unless all other securities are first excluded. Any Registrable Securities excluded or withdrawn from such underwriting shall be withdrawn from the registration.

(iii) Notwithstanding the foregoing, the Company shall not be required to effect a registration pursuant to this Section 7.5(a):

(A) in any particular jurisdiction in which the Company would be required to execute a general consent to service of process in effecting such registration, unless the Company is already subject to service in such jurisdiction and except as may be required under the Securities Act;

(B) after the Company, within the twelve (12) month period preceding the date of such request, has effected two (2) registrations pursuant to this Section 7.5(a), and such registrations have been declared or ordered effective;

(C) during the period starting with the date sixty (60) days prior to the Company's good faith estimate of the date of the filing of and ending on a date one hundred eighty (180) days following the effective date of a Company-initiated registration subject to Section 7.5(b) below, provided that the Company is actively employing in good faith its commercially reasonable efforts to cause such registration statement to become effective;

(D) if the Initiating Holders propose to dispose of Registrable Securities that may be registered on Form S-3 pursuant to Section 7.5(c) hereof; or

(E) if the Company shall furnish to Holders requesting a registration statement pursuant to this Section 7.5(a) a certificate signed by the Company's Chief Executive Officer or Chairman of the Board stating that in the good faith judgment of the Board, it would be seriously detrimental to the Company and its stockholders for such registration statement to be effected at such time, in which event the Company shall have the right to defer such filing for a period of not more than ninety (90) days after receipt of the request of the Initiating Holders; provided that such right shall be exercised by the Company not more than once in any twelve (12) month period.

(b) Company Registration.

(i) If (but without any obligation to do so) the Company proposes to register (including for this purpose a registration effected by the Company for stockholders other than the Holders) any of its stock or other securities under the Securities Act in connection with the public offering of such securities (other than (i) a registration relating to a demand pursuant to Section 7.5(a) of this Agreement or (ii) a registration relating solely to the sale of securities of participants in a Company stock plan, a registration relating to a corporate reorganization or transaction under Rule 145 of the Securities Act, a registration on any form that does not include substantially the same information as would be required to be included in a registration statement covering the sale of the Registrable Securities, or a registration in which the only Common Stock being registered is Common Stock issuable upon conversion of debt securities that are also being registered), the Company shall, at such time, promptly give each Holder written notice of such registration. Upon the written request of each Holder given within twenty (20) days after mailing of such notice by the Company in accordance with Section 8.5 of this Agreement, the Company shall, subject to the provisions of Section 7.5(b)(iii) of this Agreement, use its commercially reasonable efforts to cause to be registered under the Securities Act all of the Registrable Securities that each such Holder requests to be registered.

(ii) Right to Terminate Registration. The Company shall have the right to terminate or withdraw any registration initiated by it under this Section 7.5(b) prior to the effectiveness of such registration whether or not any Holder has elected to include securities in such registration. The expenses of such withdrawn registration shall be borne by the Company in accordance with Section 7.5(f) hereof.

(iii) Underwriting Requirements. In connection with any offering involving an underwriting of shares of the Company's capital stock, the Company shall not be required under this Section 7.5(b) to include any of the Holders' securities in such underwriting unless they accept the terms of the underwriting as agreed upon between the Company and the underwriters selected by the Company (or by other Persons entitled to select the underwriters) and enter into an underwriting agreement in customary form with such underwriters, and then only in such quantity as the underwriters determine in their sole discretion will not jeopardize the success of the offering by the Company. If the total amount of securities, including Registrable Securities, requested by stockholders to be included in such offering exceeds the amount of securities sold other than by the Company that the underwriters determine in their sole discretion is compatible with the success of the offering, then the Company shall be required to include in the offering only that number of such securities, including Registrable Securities, that the underwriters determine in their sole discretion will not jeopardize the success of the offering. In the event that the underwriters determine that less than all of the Registrable Securities requested to be registered can be included in such offering, then the Registrable Securities that are included in such offering shall be apportioned pro rata among the selling Holders based on the number of Registrable Securities held by all selling Holders or in such other proportions as shall mutually be agreed to by all such selling Holders. Notwithstanding the foregoing, in no event shall (A) any Registrable Securities be excluded from such offering unless all other stockholders' securities have been first excluded from the offering and (B) the amount of securities of the selling Holders included in the offering be reduced below twenty percent (20%) of the total amount of securities included in such offering, unless such offering is the Initial Public Offering, in which case the selling Holders may be excluded if the underwriters make the determination described above and no other stockholder's securities are included in such offering. For purposes of the preceding sentence concerning apportionment, for any selling stockholder that is a Holder of Registrable Securities and that is a venture capital fund, partnership or corporation, the affiliated venture capital funds, partners, members, retired partners and stockholders of such Holder, or the estates and family members of any such partners, members and retired partners and any trusts for the benefit of any of the foregoing Persons shall be deemed to be a single "selling Holder," and any pro rata reduction with respect to such "selling Holder" shall be based upon the aggregate amount of Registrable Securities owned by all such related entities and individuals.

(c) Form S-3 Registration. In case the Company shall receive from the Holders of at least twenty percent (20%) of the Registrable Securities (for purposes of this Section 7.5(c), the "S-3 Initiating Holders") a written request or requests that the Company effect a registration on Form S-3 and any related qualification or compliance with respect to all or a part of the Registrable Securities owned by such Holder or Holders, the Company shall:

(i) promptly give written notice of the proposed registration, and any related qualification or compliance, to all other Holders; and

(ii) use its commercially reasonable efforts to effect, as soon as practicable, such registration and all such qualifications and compliances as may be so requested and as would permit or facilitate the sale and distribution of all or such portion of such Holders' Registrable Securities as are specified in such request, together with all or such portion of the Registrable Securities of any other Holders joining in such request as are specified in a written

request given within fifteen (15) days after receipt of such written notice from the Company; provided, however, that the Company shall not be obligated to effect any such registration, qualification or compliance, pursuant to this Section 7.5(c):

(A) if Form S-3 is not available for such offering by the Holders;

(B) if the Holders, together with the holders of any other securities of the Company entitled to inclusion in such registration, propose to sell Registrable Securities and such other securities (if any) at an aggregate price to the public (net of any underwriters' discounts or commissions) of less than $3,000,000;

(C) if the Company shall furnish to all Holders requesting a registration statement pursuant to this Section 7.5(c) a certificate signed by the Company's Chief Executive Officer or Chairman of the Board stating that in the good faith judgment of the Board, it would be seriously detrimental to the Company and its stockholders for such registration statement to be effected at such time, in which event the Company shall have the right to defer such filing for a period of not more than ninety (90) days after receipt of the request of the S-3 Initiating Holders; provided that such right shall be exercised by the Company not more than once in any twelve (12) month period;

(D) if the Company has, within the twelve (12) month period preceding the date of such request, already effected two (2) registrations on Form S-3 pursuant to this Section 7.5(c);

(E) in any particular jurisdiction in which the Company would be required to qualify to do business or to execute a general consent to service of process in effecting such registration, qualification or compliance;

(F) if the Company, within thirty (30) days of receipt of the request of such S-3 Initiating Holders, gives notice of its bona fide intention to effect the filing of a registration statement with the SEC within one hundred twenty (120) days of receipt of such request (other than a registration effected solely to qualify an employee benefit plan or to effect a business combination pursuant to Rule 145), provided that the Company is actively employing in good faith its commercially reasonable efforts to cause such registration statement to become effective; or

(G) during the period starting with the date thirty (30) days prior to the Company's good faith estimate of the date of the filing of and ending on a date ninety (90) days following the effective date of a Company-initiated registration subject to Section 7.5(b) of this Agreement, provided that the Company is actively employing in good faith its commercially reasonable efforts to cause such registration statement to become effective.

(iii) If the S-3 Initiating Holders intend to distribute the Registrable Securities covered by their request by means of an underwriting, they shall so advise the Company as a part of their request made pursuant to this Section 7.5(c) and the Company shall include such information in the written notice referred to in Section 7.5(c)(i). The

provisions of Section 7.5(a)(ii) of this Agreement shall be applicable to such request (with the substitution of Section 7.5(c) for references to Section 7.5(a)).

(iv) Subject to the foregoing, the Company shall file a registration statement covering the Registrable Securities and other securities so requested to be registered as soon as practicable after receipt of the request or requests of the S-3 Initiating Holders. Registrations effected pursuant to this Section 7.5(c) shall not be counted as requests for registration effected pursuant to Section 7.5(a) of this Agreement.

(d) Obligations of the Company. Whenever required under this Section 7.5 to effect the registration of any Registrable Securities, the Company shall, as expeditiously as reasonably possible:

(i) prepare and file with the SEC a registration statement with respect to such Registrable Securities and use its commercially reasonable efforts to cause such registration statement to become effective, and, upon the request of the Holders of a majority of the Registrable Securities registered thereunder, keep such registration statement effective for a period of up to one hundred twenty (120) days or, if earlier, until the distribution contemplated in the Registration Statement has been completed;

(ii) prepare and file with the SEC such amendments and supplements to such registration statement and the prospectus used in connection with such registration statement as may be necessary to comply with the provisions of the Securities Act with respect to the disposition of all securities covered by such registration statement;

(iii) furnish to the Holders such number of copies of a prospectus, including a preliminary prospectus and any Free Writing Prospectus, in conformity with the requirements of the Securities Act, and such other documents as they may reasonably request in order to facilitate the disposition of Registrable Securities owned by them;

(iv) use its commercially reasonable efforts to register and qualify the securities covered by such registration statement under such other securities or Blue Sky laws of such jurisdictions as shall be reasonably requested by the Holders, provided that the Company shall not be required in connection therewith or as a condition thereto to qualify to do business or to file a general consent to service of process in any such states or jurisdictions;

(v) in the event of any underwritten public offering, enter into and perform its obligations under an underwriting agreement, in usual and customary form, with the managing underwriter of such offering;

(vi) notify each Holder of Registrable Securities covered by such registration statement at any time when a prospectus or Free Writing Prospectus (to the extent prepared by or on behalf of the Company) relating thereto is required to be delivered under the Securities Act of the happening of any event as a result of which the prospectus included in such registration statement, as then in effect, includes an untrue statement of a material fact or omits to state a material fact required to be stated therein or necessary to make the statements therein not misleading in the light of the circumstances then existing, and, at the request of any such Holder, the Company will, as soon as reasonably practicable, file and furnish

to all such Holders a supplement or amendment to such prospectus or Free Writing Prospectus (to the extent prepared by or on behalf of the Company) so that, as thereafter delivered to the purchasers of such Registrable Securities, such prospectus will not contain an untrue statement of a material fact or omit to state any fact necessary to make the statements therein not misleading in light of the circumstances under which they were made;

(vii) cause all such Registrable Securities registered pursuant to this Section 7.5 to be listed on a national exchange or trading system and on each securities exchange and trading system on which similar securities issued by the Company are then listed; and

(viii) provide a transfer agent and registrar for all Registrable Securities registered pursuant to this Agreement and a CUSIP number for all such Registrable Securities, in each case not later than the effective date of such registration.

Notwithstanding the provisions of this Section 7.5, the Company shall be entitled to postpone or suspend, for a reasonable period of time, the filing, effectiveness or use of, or trading under, any registration statement if the Company shall determine that any such filing or the sale of any securities pursuant to such registration statement would in the good faith judgment of the Board:

(A) materially impede, delay or interfere with any material pending or proposed financing, acquisition, corporate reorganization or other similar transaction involving the Company for which the Board has authorized negotiations;

(B) materially and adversely impair the consummation of any pending or proposed material offering or sale of any class of securities by the Company; or

(C) require disclosure of material nonpublic information that, if disclosed at such time, would be materially harmful to the interests of the Company and its stockholders; provided, however, that during any such period all executive officers and directors of the Company are also prohibited from selling securities of the Company (or any security of any of the Company's subsidiaries or affiliates).

In the event of the suspension of effectiveness of any registration statement pursuant to this Section 7.5(d), the applicable time period during which such registration statement is to remain effective shall be extended by that number of days equal to the number of days the effectiveness of such registration statement was suspended.

(e) Information from Holder. It shall be a condition precedent to the obligations of the Company to take any action pursuant to this Section 7.5 with respect to the Registrable Securities of any selling Holder that such Holder shall furnish to the Company such information regarding itself, the Registrable Securities held by it, and the intended method of disposition of such securities as shall be reasonably required to effect the registration of such Holder's Registrable Securities.

(f) Expenses of Registration. All expenses other than underwriting discounts and commissions incurred in connection with registrations, filings or qualifications pursuant to Sections 7.5(a) and 7.5(b) of this Agreement, including, without limitation, all registration, filing and qualification fees, printers' and accounting fees, fees and disbursements of counsel for the Company and the reasonable fees and disbursements of one counsel for the selling Holders (not to exceed $50,000) shall be borne by the Company. Notwithstanding the foregoing, the Company shall not be required to pay for any expenses of any registration proceeding begun pursuant to Section 7.5(a) of this Agreement if the registration request is subsequently withdrawn at the request of the Holders of a majority of the Registrable Securities to be registered (in which case all participating Holders shall bear such expenses pro rata based upon the number of Registrable Securities that were to be included in the withdrawn registration) unless, in the case of a registration requested under Section 7.5(a) of this Agreement, the Holders of a majority of the Registrable Securities agree to forfeit their right to one demand registration pursuant to Section 7.5(a) of this Agreement; provided, however, that if at the time of such withdrawal, the Holders have learned of a material adverse change in the condition, business or prospects of the Company from that known to the Holders at the time of their request and have withdrawn the request with reasonable promptness following disclosure by the Company of such material adverse change, then the Holders shall not be required to pay any of such expenses and shall retain their rights pursuant to Section 7.5(a) of this Agreement. All expenses incurred in connection with a registration requested pursuant to Section 7.5(c) of this Agreement, including, without limitation, all registration, filing, qualification, printer's and accounting fees and the reasonable fees and disbursements of counsel for the selling Holder or Holders and counsel for the Company, shall be borne pro rata by the Holder or Holders participating in such registration effected pursuant to Section 7.5(c) of this Agreement.

(g) Delay of Registration. No Holder shall have any right to obtain or seek an injunction restraining or otherwise delaying any such registration as the result of any controversy that might arise with respect to the interpretation or implementation of this Section 7.5.

(h) Indemnification. In the event any Registrable Securities are included in a registration statement under this Section 7.5:

(i) To the extent permitted by law, the Company will indemnify and hold harmless each Holder, the partners, members, officers, directors and stockholders of each Holder, legal counsel and accountants for each Holder, any underwriter (as defined in the Securities Act) for such Holder and each Person, if any, who controls such Holder or underwriter within the meaning of the Securities Act or the Exchange Act, against any losses, claims, damages or liabilities (joint or several) to which they may become subject under the Securities Act, the Exchange Act, any state securities laws or any rule or regulation promulgated under the Securities Act, the Exchange Act or any state securities laws, insofar as such losses, claims, damages, or liabilities (or actions or proceedings, whether commenced or threatened, in respect thereof) arise out of or are based upon any of the following statements, omissions or violations (collectively, a "Violation"): (i) any untrue or alleged untrue statement of a material fact contained in such registration statement, including any preliminary prospectus, final prospectus, or Free Writing Prospectus contained therein or any amendments or supplements thereto, any issuer information (as defined in Rule 433 of the Securities Act) filed or required to

be filed pursuant to Rule 433(d) under the Securities Act or any other document incident to such registration prepared by or on behalf of the Company or used or referred to by the Company, (ii) the omission or alleged omission of a material fact required to be stated in such registration statement, or necessary to make the statements therein not misleading or (iii) any violation or alleged violation by the Company of the Securities Act, the Exchange Act, any state securities laws or any rule or regulation promulgated under the Securities Act, the Exchange Act or any state securities laws, and the Company will reimburse each such Holder, underwriter, controlling Person or other aforementioned Person for any legal or other expenses reasonably incurred by them in connection with investigating or defending any such loss, claim, damage, liability, action or proceeding as such expenses are incurred; provided, however, that the indemnity agreement contained in this Section 7.5(h)(i) shall not apply to amounts paid in settlement of any such loss, claim, damage, liability, action or proceeding if such settlement is effected without the consent of the Company (which consent shall not be unreasonably withheld), nor shall the Company be liable in any such case for any such loss, claim, damage, liability, action or proceeding to the extent that it arises out of or is based upon a Violation that occurs in reliance upon, and in conformity with, written information furnished expressly for use in connection with such registration by any such Holder, underwriter, controlling Person or other aforementioned Person.

(ii) To the extent permitted by law, each selling Holder, severally and not jointly, will indemnify and hold harmless the Company, each of its directors, each of its officers who has signed the registration statement, each Person, if any, who controls the Company within the meaning of the Securities Act, legal counsel and accountants for the Company, any underwriter, any other Holder selling securities in such registration statement and any controlling Person of any such underwriter or other Holder, against any losses, claims, damages or liabilities (joint or several) to which any of the foregoing Persons may become subject, under the Securities Act, the Exchange Act, any state securities laws or any rule or regulation promulgated under the Securities Act, the Exchange Act or any state securities laws, insofar as such losses, claims, damages or liabilities (or actions or proceedings, whether commenced or threatened, in respect thereof) arise out of or are based upon any Violation, in each case to the extent (and only to the extent) that such Violation occurs in reliance upon and in conformity with written information furnished by such Holder expressly for use in connection with such registration; and each such Holder will reimburse any Person intended to be indemnified pursuant to this Section 7.5(h)(ii) for any legal or other expenses reasonably incurred by such Person in connection with investigating or defending any such loss, claim, damage, liability, action or proceeding as such expenses are incurred; provided, however, that the indemnity agreement contained in this Section 7.5(h)(ii) shall not apply to amounts paid in settlement of any such loss, claim, damage, liability, action or proceeding if such settlement is effected without the consent of the Holder (which consent shall not be unreasonably withheld), and provided that in no event shall any indemnity under this Section 7.5(h)(ii) exceed the gross proceeds from the offering received by such Holder.

(iii) Promptly after receipt by an indemnified party under this Section 7.5(h) of notice of the commencement of any action or proceeding (including any governmental action or proceeding) for which a party may be entitled to indemnification, such indemnified party will, if a claim in respect thereof is to be made against any indemnifying party under this Section 7.5(h), deliver to the indemnifying party a written notice of the commencement thereof and the indemnifying party shall have the right to participate in and, to

the extent the indemnifying party so desires, jointly with any other indemnifying party similarly noticed, to assume the defense thereof with counsel mutually satisfactory to the parties; provided, however, that an indemnified party (together with all other indemnified parties that may be represented without conflict by one counsel) shall have the right to retain one (1) separate counsel, with the fees and expenses to be paid by the indemnifying party, if representation of such indemnified party by the counsel retained by the indemnifying party would be inappropriate due to actual or potential differing interests between such indemnified party and any other party represented by such counsel in such proceeding. The failure to deliver written notice to the indemnifying party within a reasonable time of the commencement of any such action or proceeding, if prejudicial to its ability to defend such action or proceeding, shall relieve such indemnifying party of any liability to the indemnified party under this Section 7.5(h) to the extent of such prejudice, but the omission to so deliver written notice to the indemnifying party will not relieve such indemnifying party of any liability that it may have to any indemnified party otherwise than under this Section 7.5(h).

(iv) If the indemnification provided for in this Section 7.5(h) is held by a court of competent jurisdiction to be unavailable to an indemnified party with respect to any loss, liability, claim, damage or expense referred to herein, then the indemnifying party, in lieu of indemnifying such indemnified party hereunder, shall contribute to the amount paid or payable by such indemnified party as a result of such loss, liability, claim, damage or expense in such proportion as is appropriate to reflect the relative fault of the indemnifying party on the one hand and the indemnified party on the other hand in connection with the statements or omissions that resulted in such loss, liability, claim, damage or expense, as well as any other relevant equitable considerations; provided, however, that (A) no contribution by any Holder, when combined with any amounts paid by such Holder pursuant to Section 7.5(h)(ii), shall exceed the gross proceeds from the offering received by such Holder and (B) no Person guilty of fraudulent misrepresentation (within the meaning of Section 11(f) of the Securities Act) will be entitled to contribution from any Person who was not guilty of such fraudulent misrepresentation; and provided further that in no event shall a Holder's liability pursuant to this Section 7.5(h)(iv), when combined with the amounts paid or payable by such Holder pursuant to Section 7.5(h)(ii), exceed the proceeds from the offering received by such Holder (net of any expenses paid by such Holder). The relative fault of the indemnifying party and the indemnified party shall be determined by reference to, among other things, whether the untrue or alleged untrue statement of a material fact or the omission or alleged omission to state a material fact relates to information supplied by the indemnifying party or by the indemnified party and the parties' relative intent, knowledge, access to information and opportunity to correct or prevent such statement or omission.

(v) Notwithstanding the foregoing, to the extent that the provisions on indemnification and contribution contained in the underwriting agreement entered into in connection with the underwritten public offering are in conflict with the foregoing provisions, the provisions in the underwriting agreement shall control.

(vi) The obligations of the Company and Holders under this Section 7.5(h)(ii) shall survive the completion of any offering of Registrable Securities in a registration statement under this Section 7.5 and otherwise.

(i) Reports Under the Exchange Act. With a view to making available to the Holders the benefits of Rule 144 and any other rule or regulation of the SEC that may at any time permit a Holder to sell securities of the Company to the public without registration or pursuant to a registration on Form S-3, the Company agrees to:

(i) make and keep public information available, as those terms are understood and defined in Rule 144, at all times after the effective date of the Initial Public Offering;

(ii) file with the SEC in a timely manner all reports and other documents required of the Company under the Securities Act and the Exchange Act; and

(iii) furnish to any Holder, so long as the Holder owns any Registrable Securities, forthwith upon request (A) a written statement by the Company that it has complied with the reporting requirements of Rule 144 (at any time after ninety (90) days after the effective date of the first registration statement filed by the Company), the Securities Act and the Exchange Act (at any time after it has become subject to such reporting requirements), or that it qualifies as a registrant whose securities may be resold pursuant to Form S-3 (at any time after it so qualifies), (B) a copy of the most recent annual or quarterly report of the Company and such other reports and documents so filed by the Company and (C) such other information as may be reasonably requested to avail any Holder of any rule or regulation of the SEC that permits the selling of any such securities without registration or pursuant to such form.

(j) Assignment of Registration Rights. The rights to cause the Company to register Registrable Securities pursuant to this Section 7.5 may be assigned (but only with all related obligations) by a Holder to a transferee or assignee of such securities that (i) is an Affiliate, subsidiary, parent, partner, limited partner, retired partner, member or stockholder of a Holder or (ii) is a Holder's family member or trust for the benefit of an individual Holder; provided: (A) the Company is, within a reasonable time after such transfer, furnished with written notice of the name and address of such transferee or assignee and the securities with respect to which such registration rights are being assigned; (B) such transferee or assignee agrees in writing to be bound by and subject to the terms and conditions of this Agreement, including, without limitation, the provisions of Section 8.11 of this Agreement; and (C) such assignment shall be effective only if immediately following such transfer the further disposition of such securities by the transferee or assignee is restricted under the Securities Act.

(k) Limitations on Subsequent Registration Rights. From and after the date of this Agreement, the Company shall not, without the prior written consent of the Requisite Noteholders, enter into any agreement with any holder or prospective holder of any securities of the Company that would allow such holder or prospective holder (i) to include any of such securities in any registration filed under Section 7.5(a), Section 7.5(b) or Section 7.5(c) of this Agreement, unless under the terms of such agreement, such holder or prospective holder may include such securities in any such registration only to the extent that the inclusion of such securities will not reduce the amount of the Registrable Securities of the Holders that are included or (ii) to demand registration of their securities.

(l) Termination of Registration Rights. No Holder shall be entitled to exercise any right provided for in this Section 7.5 upon the earlier of (i) such time after the Initial Public Offering at which such Holder can sell all shares held by it in compliance with Rule 144(b)(1)(i) and (ii) the fifth anniversary of the Initial Public Offering.

7.6 Voting Provisions Regarding the Board Provisions.

(a) Each Common Holder, Takeda and Frazier agrees to vote, or cause to be voted, all Shares owned by such Common Holder, Takeda and Frazier, or over which such Common Holder, Takeda and Frazier has voting control, from time to time and at all times, in whatever manner as shall be necessary to ensure that the size of the Board shall be set and remain at seven (7) directors. Three of the seven director seats will be vacant as of the Initial Closing.

(b) Each Common Holder, Takeda and Frazier agrees to vote, or cause to be voted, all Shares owned by such Common Holder, Takeda and Frazier, or over which such Stockholder has voting control, from time to time and at all times, in whatever manner as shall be necessary to ensure that at each annual or special meeting of stockholders at which an election of directors is held or pursuant to any written consent of the stockholders, the following persons shall be elected to the Board:

(i) One (1) person designated from time to time by Frazier, who shall initially be James Topper;

(ii) One (1) person designated from time to time by the Lenders other than Frazier, which individual shall initially be Jon Edwards;

(iii) One (1) person designated from time to time by Takeda or its affiliates, which seat shall initially be vacant; provided, however, that if such seat is vacant, Takeda or its affiliates shall not have the right to designate a member to the Board to fill such vacant seat pursuant to this Section 7.6(b)(iii) at any time that the Board consists of fewer than five (5) individuals that are not affiliated with Takeda;

(iv) One (1) person designated from time to time by the holders of a majority of the Common Stock, which individual shall initially be Tadataka Yamada, M.D. (who shall initially be the Chairman of the Board);

(v) The Company's Chief Executive Officer, who shall initially be David Socks (the "CEO Director"), provided that if for any reason the CEO Director shall cease to serve as the Chief Executive Officer of the Company, each of the Common Holders shall promptly vote their respective Shares (A) to remove the former Chief Executive Officer of the Company from the Board if such person has not resigned as a member of the Board; and (B) to elect such person's replacement as Chief Executive Officer of the Company as the new CEO Director; and

(vi) Two (2) individuals not otherwise an Affiliate of the Company or of any Lender who is mutually acceptable to the other members of the Board.

(c) In the absence of any designation from the Persons or groups with the right to designate a director as specified above, the director previously designated by them and then serving shall be reelected if still eligible and willing to serve as provided herein and otherwise, such Board seat shall remain vacant.

(d) Each Common Holder, Takeda and Frazier also agrees to vote, or cause to be voted, all Shares owned by such Common Holder, Takeda and Frazier, or over which such Common Holder, Takeda and Frazier has voting control, from time to time and at all times, in whatever manner as shall be necessary to ensure that:

(i) no director elected pursuant to Sections 7.6(b) or 7.6(c) of this Agreement may be removed from office other than for cause unless (A) such removal is directed or approved by the Person(s) originally entitled to designate or approve such director pursuant to Section 7.6(b); or (B) the Person(s) originally entitled to designate or approve such director pursuant to Section 7.6(b) is no longer so entitled to designate or approve such director;

(ii) any vacancies created by the resignation, removal or death of a director elected pursuant to Sections 7.6(b) or 7.6(c) shall be filled pursuant to the provisions of this Section 7.6; and

(iii) upon the request of any party entitled to designate a director as provided in Section 7.6(b) to remove such director, such director shall be removed.

All Common Holders, Takeda and Frazier agree to execute any written consents required to perform the obligations of this Section 7.6, and the Company agrees at the request of any Person or group entitled to designate directors to call a special meeting of stockholders for the purpose of electing directors.

(e) No Common Holder, nor any Affiliate of any Common Holder, nor Takeda, nor Frazier shall have any liability as a result of designating a person for election as a director for any act or omission by such designated person in his or her capacity as a director of the Company, nor shall any Common Holder, Takeda or Frazier have any liability as a result of voting for any such designee in accordance with the provisions of this Section 7.6.

(f) The Company agrees to use its best efforts, within the requirements of applicable law, to ensure that the rights granted under this Section 7.6 are effective and that the parties enjoy the benefits of this Section 7.6. Such actions include, without limitation, the use of the Company's best efforts to cause the nomination and election of the directors as provided in this Section 7.6.

(g) Each party acknowledges and agrees that each party hereto will be irreparably damaged in the event any of the provisions of this Section 7.6 are not performed by the parties in accordance with their specific terms or are otherwise breached. Accordingly, it is agreed that each of the Company, the Common Holders, Takeda and Frazier shall be entitled to an injunction to prevent breaches of this Section 7.6, and to specific enforcement of this Section 7.6 and its terms and provisions in any action instituted in any court of the United States or any state having subject matter jurisdiction.

(h) All remedies, either under this Section 7.6 or by law or otherwise afforded to any party, shall be cumulative and not alternative.

(i) This Section 7.6 shall be effective as of the date hereof and shall continue in effect until and shall terminate upon the earliest to occur of (a) the consummation of the Initial Public Offering (other than a registration statement relating either to the sale of securities to employees of the Company pursuant to its stock option, stock purchase or similar plan or an SEC Rule 145 transaction) and (b) the consummation of any other Corporate Transaction.

(j) In the event that after the date of this Agreement, the Company enters into an agreement with any Person to issue shares of capital stock to such Person, then, the Company shall cause such Person, as a condition precedent to entering into such agreement, to become a party to this Agreement by executing an Adoption Agreement in the form attached hereto as Exhibit G, agreeing to be bound by and subject to the terms of this Agreement as a Common Holder and thereafter such person shall be deemed a Stockholder for all purposes under this Agreement.

(k) Each transferee or assignee of any Shares subject to this Agreement shall continue to be subject to the terms hereof, and, as a condition precedent to the Company's recognition of such transfer, each transferee or assignee shall agree in writing to be subject to each of the terms of this Agreement by executing and delivering an Adoption Agreement substantially in the form attached hereto as Exhibit G. Upon the execution and delivery of an Adoption Agreement by any transferee, such transferee shall be deemed to be a party hereto as if such transferee were the transferor and such transferee's signature appeared on the signature pages of this Agreement and shall be deemed to be a Common Holder, as applicable. The Company shall not permit the transfer of the Shares subject to this Agreement on its books or issue a new certificate representing any such Shares unless and until such transferee shall have complied with the terms of this Section 7.6(k). Each certificate instrument, or book entry representing the Shares subject to this Section 7.6 if issued on or after the date of this Agreement shall be notated by the Company with a legend reading substantially as follows:

> "THE SHARES REPRESENTED HEREBY ARE SUBJECT TO A NOTE PURCHASE AGREEMENT, AS MAY BE AMENDED FROM TIME TO TIME, (A COPY OF WHICH MAY BE OBTAINED UPON WRITTEN REQUEST FROM THE COMPANY), AND BY ACCEPTING ANY INTEREST IN SUCH SHARES THE PERSON ACCEPTING SUCH INTEREST SHALL BE DEEMED TO AGREE TO AND SHALL BECOME BOUND BY ALL THE PROVISIONS OF THAT NOTE PURCHASE AGREEMENT, INCLUDING CERTAIN RESTRICTIONS ON VOTING, TRANSFER AND OWNERSHIP SET FORTH THEREIN."

The Company, by its execution of this Agreement, agrees that it will cause the certificates instruments, or book entry evidencing the Shares issued after the date hereof to be notated with the legend required by this Section 7.6(k), and it shall supply, free of charge, a copy of this Agreement to any holder of such Shares upon written request from such holder to the Company at its principal office. The parties to this Agreement do hereby agree that the failure to cause the

certificates, instruments, or book entry evidencing the Shares to be notated with the legend required by this Section 7.6(k) herein and/or the failure of the Company to supply, free of charge, a copy of this Agreement as provided hereunder shall not affect the validity or enforcement of this Agreement.

(l) In the event of any issuance of Shares or the voting securities of the Company hereafter to any of the Common Holders (including, without limitation, in connection with any stock split, stock dividend, recapitalization, reorganization, or the like), such Shares shall become subject to this Agreement and shall be notated with the legend set forth in Section 7.6(k).

(m) The voting of Shares pursuant to this Agreement may be effected in person, by proxy, by written consent or in any other manner permitted by applicable law. For the avoidance of doubt, voting of the Shares pursuant to the Agreement need not make explicit reference to the terms of this Agreement.

(n) The Company will promptly pay or reimburse the directors for all reasonable out-of-pocket expenses incurred in connection with attending Board or committee meetings of the Company or in performing their duties as directors of the Company (including expenses incurred in performing their duties as members of committees of the Board).

7.7 Protective Provisions. So long as a majority of the principal amount of the Notes originally issued pursuant to this Agreement remains outstanding, the Company shall not (by amendment, merger, consolidation or otherwise) without (in addition to any other vote required by law or the Certificate of Incorporation) first obtaining the written consent of the Requisite Noteholders:

(a) consummate a Corporate Transaction;

(b) amend, alter or repeal any provision of the Certificate of Incorporation or Bylaws;

(c) authorize or issue any debt security (other than the Notes) in excess of $250,000 in the aggregate; provided, however, that such Requisite Noteholder approval shall not be required for the contemplated debt facility (in an amount not to exceed $50,000,000 in principal amount) with Silicon Valley Bank as long as the final terms and conditions of such proposed debt facility are unanimously approved by the Board;

(d) redeem, purchase or otherwise acquire (or pay into or set aside for a sinking fund for such purpose) any share or shares of Preferred Stock or Common Stock; provided, however, that this restriction shall not apply to the repurchase of shares of Common Stock from employees, officers, directors, consultants or other persons performing services for the Company or any subsidiary pursuant to agreements under which the Company has the option to repurchase such shares upon the occurrence of certain events, such as the termination of employment or service, or pursuant to a right of first refusal;

(e) issue, create or authorize the creation of any security that is senior to the Notes or otherwise more favorable to the purchasers thereof than the terms of the Notes;

provided, however, that such Requisite Noteholder approval shall not be required for the contemplated debt facility (in an amount not to exceed $50,000,000 in principal amount) with Silicon Valley Bank as long as the final terms and conditions of such proposed debt facility are unanimously approved by the Board;

(f) change the authorized number of directors of the Company; and

(g) pay or declare any dividend on any shares of capital stock of the Company prior to the repayment or conversion of the Notes in accordance with the terms of this Agreement other than dividends payable on the Common Stock solely in the form of additional shares of Common Stock.

7.8 Directors' and Officers' Insurance. The Company has as of the date hereof or shall within thirty (30) days of the date hereof use its commercially reasonable efforts to obtain from financially sound and reputable insurers directors and officers liability insurance in an amount and on terms and conditions satisfactory to the Board, and will use its commercially reasonable efforts to cause such insurance policy to be maintained until such time as the Board determines that such insurance should be discontinued.

7.9 Observer Rights.

(a) Abingworth Observer Right. As long as Abingworth Bioventures VII LP ("Abingworth") holds a Note (or securities issued upon the conversion thereof), the Company shall invite a representative of Abingworth, who shall initially be Shelley Chu, to attend all meetings of its Board in a nonvoting observer capacity and, in this respect, shall give such representative copies of all notices, minutes, consents and other materials that it provides to its directors; provided, however, that such representative shall agree to hold in confidence and trust with respect to all information so provided; and, provided further, that the Company reserves the right to withhold any information and to exclude such representative from any meeting or portion thereof if access to such information or attendance at such meeting could adversely affect the attorney-client privilege between the Company and its counsel.

(b) RA Capital Observer Right. As long as RA Capital Healthcare Fund, L.P. ("RA Capital") holds a Note (or securities issued upon the conversion thereof), the Company shall invite a representative of RA Capital, who shall initially be Jake Simson, to attend all meetings of its Board in a nonvoting observer capacity and, in this respect, shall give such representative copies of all notices, minutes, consents and other materials that it provides to its directors; provided, however, that such representative shall agree to hold in confidence and trust with respect to all information so provided; and, provided further, that the Company reserves the right to withhold any information and to exclude such representative from any meeting or portion thereof if access to such information or attendance at such meeting could adversely affect the attorney-client privilege between the Company and its counsel.

(c) Medicxi Observer Right. In the event Affiliates of Medicxi Ventures Management (Jersey) Limited ("Medicxi") are not entitled to designate a member of the Board, the Company shall invite a representative of Medicxi to attend all meetings of its Board in a nonvoting observer capacity and, in this respect, shall give such representative copies

of all notices, minutes, consents and other materials that it provides to its directors; provided, however, that such representative shall agree to hold in confidence and trust with respect to all information so provided; and, provided further, that the Company reserves the right to withhold any information and to exclude such representative from any meeting or portion thereof if access to such information or attendance at such meeting could adversely affect the attorney-client privilege between the Company and its counsel.

7.10 Confidentiality. Each Lender agrees, severally and not jointly, to use the same degree of care as such Lender uses to protect its own confidential information for any information obtained pursuant to this Agreement which the Company identifies in writing as being proprietary or confidential and such Lender acknowledges that it will not, unless otherwise required by law or the rules of any national securities exchange, association or marketplace, disclose such information without the prior written consent of the Company except such information that (a) was in the public domain prior to the time it was furnished to such Lender, (b) is or becomes (through no willful improper action or inaction by such Lender) generally available to the public, (c) was in its possession or known by such Lender without restriction prior to receipt from the Company, (d) was rightfully disclosed to such Lender by a third party without restriction or (e) was independently developed without any use of the Company's confidential information. Notwithstanding the foregoing, each Lender that is a limited partnership or limited liability company may disclose such proprietary or confidential information to any former partners or members who retained an economic interest in such Lender, current or prospective partner of the partnership or any subsequent partnership under common investment management, investment advisor, limited partner, general partner, member or management company of such Lender (or any employee or representative of any of the foregoing) (each of the foregoing Persons, a "Permitted Disclosee") or legal counsel, accountants, consultant or representatives for such Lender. Furthermore, nothing contained herein shall prevent any Lender or any Permitted Disclosee from (i) entering into any business, entering into any agreement with a third party, or investing in or engaging in investment discussions with any other company (whether or not competitive with the Company), provided that such Lender or Permitted Disclosee does not, except as permitted in accordance with this Section 7.10, disclose or otherwise make use of any proprietary or confidential information of the Company in connection with such activities, or (ii) making any disclosures required by law, rule, regulation or court or other governmental order. The Company shall use the same degree of care as it uses to protect its own confidential information for any information obtained pursuant to this Agreement which any such Lender identifies in writing as being proprietary or confidential and the Company acknowledges that it will not, unless otherwise required by law or the rules of any national securities exchange, association or marketplace, disclose such information without the prior written consent of such Lender except such information that (a) was in the public domain prior to the time it was furnished to the Company, (b) is or becomes (through no willful improper action or inaction by the Company) generally available to the public, (c) was in its possession or known by the Company without restriction prior to receipt from such Lender, (d) was rightfully disclosed to the Company by a third party without restriction or (e) was independently developed without any use of such Lender confidential information. The confidentiality obligations set forth in this Section 7.10 will survive for a period of five (5) years following the termination of this Agreement.

8. Miscellaneous.

8.1 Successors and Assigns. Except as otherwise provided herein, the terms and conditions of this Agreement shall inure to the benefit of and be binding upon the respective successors and assigns of the parties; provided, however, the Company may not assign its obligations under this Agreement without the written consent of the Requisite Noteholders. For the avoidance of doubt, a Lender that is a venture capital fund or private equity investor may assign or transfer its rights and obligations under this Agreement to its Affiliates. Nothing in this Agreement, express or implied, is intended to confer upon any party other than the parties hereto or their respective successors and assigns any rights, remedies, obligations or liabilities under or by reason of this Agreement, except as expressly provided in this Agreement.

8.2 Governing Law. This Agreement and the Notes shall be governed by and construed under the laws of the State of Delaware as applied to agreements among Delaware residents, made and to be performed entirely within the State of Delaware, without regard to any choice of laws rules that may result in the application of the laws of any other jurisdiction.

8.3 Counterparts; Delivery. This Agreement may be executed by electronic signature and in two (2) or more counterparts, each of which shall be deemed an original, but all of which together shall constitute one (1) and the same instrument. Counterparts may be delivered by facsimile, electronic mail (including pdf) or other transmission method and any counterpart so delivered shall be deemed to have been duly and validly delivered and be valid and effective for all purposes.

8.4 Titles and Subtitles. The titles and subtitles used in this Agreement are used for convenience only and are not to be considered in construing or interpreting this Agreement.

8.5 Notices. All notices and other communications given or made pursuant hereto shall be in writing and shall be deemed effectively given: (a) upon personal delivery to the party to be notified, (b) when sent by confirmed electronic mail or facsimile if sent during normal business hours of the recipient, if not so confirmed, then on the next business day, (c) five (5) days after having been sent by registered or certified mail, return receipt requested, postage prepaid, or (d) one (1) day after deposit with a nationally recognized overnight courier, specifying next day delivery, with written verification of receipt. All communications shall be sent to the respective parties at the following addresses (or at such other addresses as shall be specified by notice given in accordance with this Section 8.5):

If to the Company:

Phathom Pharmaceuticals, Inc.

With a copy to (which alone shall not constitute sufficient notice):

Latham & Watkins LLP
12670 High Bluff Drive
San Diego, CA 92103
Attention: Cheston J. Larson
Email: cheston.larson@lw.com
Facsimile No.: (858) 523-5450

If to Lenders:

At the respective addresses shown on the signature pages hereto.

With a copy to (which alone shall not constitute sufficient notice):

Gunderson Dettmer Stough Villeneuve Franklin & Hachigian, LLP
One Marina Park Drive, Suite 900
Boston, MA 02210
Attention: Timothy H. Ehrlich and Albert W. Vanderlaan
Email: tehrlich@gunder.com; avanderlaan@gunder.com
Facsimile No.: (617) 648-9199

8.6 Finder's Fee. Each party represents that it neither is nor will be obligated for any finder's fee or commission in connection with this transaction. Each Lender agrees to indemnify and to hold harmless the Company from any liability for any commission or compensation in the nature of a finder's fee (and the costs and expenses of defending against such liability or asserted liability) for which such Lender or any of its officers, partners, employees or representatives is responsible. The Company agrees to indemnify and hold harmless each Lender from any liability for any commission or compensation in the nature of a finder's fee (and the costs and expenses of defending against such liability or asserted liability) for which the Company or any of its officers, employees or representatives is responsible.

8.7 Expenses. If any action at law or in equity is necessary to enforce or interpret the terms of this Agreement, the prevailing party shall be entitled to reasonable attorneys' fees, costs and necessary disbursements in addition to any other relief to which such party may be entitled. Each party hereto shall pay all costs and expenses that it incurs with respect to the negotiation, execution, delivery and performance of this Agreement. At the Initial Closing, the Company shall reimburse the reasonable fees and expenses of Gunderson Dettmer Stough Villeneuve Franklin & Hachigian, LLP, counsel for the Lenders, not to exceed $70,000.

8.8 Entire Agreement; Amendments and Waivers. This Agreement, the Notes and the other documents expressly delivered pursuant hereto or in connection with the Closing hereunder constitute the full and entire understanding and agreement between the parties with regard to the subjects hereof and thereof. The Company's agreements with each of the Lenders are separate agreements, and the sales of the Notes to each of the Lenders are separate sales. Nonetheless, any term of this Agreement or the Notes may be amended and the

observance of any term of this Agreement or the Notes may be waived (either generally or in a particular instance and either retroactively or prospectively), with the written consent of the Company and the Requisite Noteholders. In addition, (i) no term of this Agreement or the Notes may be amended or waived without the written consent of each Lender if such amendment or waiver materially, adversely and disproportionately affects such Lender in a manner different than all other Lenders, (ii) Section 1 of the Note held by each Lender shall not be amended or waived with respect to such Lender without the written consent of such Lender, (iii) the outstanding principal and interest amount of the Note held by each Lender shall not be amended or waived with respect to such Lender without the written consent of such Lender, and (iv) Section 1(ff), Section 7.2, Section 7.4 and Section 7.6(b)(iii) of this Agreement shall not be amended or waived with respect to Takeda without the written consent of Takeda. Any waiver or amendment effected in accordance with this Section 8.8 shall be binding upon each party to this Agreement and any holder of any Note purchased under this Agreement at the time outstanding and each future holder of all such Notes.

8.9 Effect of Amendment or Waiver. Each Lender acknowledges that by the operation of Section 8.8 hereof, and subject to the limitations set forth therein, the Requisite Noteholders will have the right and power to diminish or eliminate all rights of such Lender under this Agreement and each Note issued to such Lender.

8.10 Severability. If one or more provisions of this Agreement are held to be unenforceable under applicable law, such provision shall be excluded from this Agreement and the balance of the Agreement shall be interpreted as if such provision were so excluded and shall be enforceable in accordance with its terms.

8.11 "Market Stand-Off" Agreement. Each Lender hereby agrees that it will not, without the prior written consent of the managing underwriter, during the period commencing on the date of the final prospectus relating to the Initial Public Offering and ending on the date specified by the Company and the managing underwriter (such period not to exceed one hundred eighty (180) days) (a) lend, offer, pledge, sell, contract to sell, sell any option or contract to purchase, purchase any option or contract to sell, grant any option, right or warrant to purchase, or otherwise transfer or dispose of, directly or indirectly, any shares of Common Stock or any securities convertible into or exercisable or exchangeable for Common Stock held immediately prior to the effectiveness of the registration statement for such offering, or (b) enter into any swap or other arrangement that transfers to another, in whole or in part, any of the economic consequences of ownership of the Common Stock, whether any such transaction described in clause (a) or (b) above is to be settled by delivery of Common Stock or other securities, in cash or otherwise. The foregoing provisions of this Section 8.11 shall apply only to the Company's Initial Public Offering, shall not apply to the sale of any shares to an underwriter pursuant to an underwriting agreement, and shall only be applicable to the Lenders if all officers, directors and greater than one percent (1%) stockholders of the Company enter into similar agreements. The underwriters in connection with the Company's Initial Public Offering are intended third-party beneficiaries of this Section 8.11 and shall have the right, power and authority to enforce the provisions hereof as though they were a party hereto. Each Lender further agrees to execute such agreements as may be reasonably requested by the underwriters in the Company's Initial Public Offering that are consistent with this Section 8.11 or that are necessary to give further effect thereto. Notwithstanding the foregoing, the Company and the

managing underwriter may extend the market stand-off period specified above solely to the extent necessary to accommodate regulatory restrictions on (1) the publication or other distribution of research reports, and (2) analyst recommendations and opinions, including, without limitation, the restrictions, if any, contained in FINRA Rule 2241 or any successor provisions or amendments thereto. Any discretionary waiver or termination of the restrictions of any or all of such agreements by the Company or the underwriters shall apply to all Lenders subject to such agreements pro rata based on the number of shares subject to such agreements.

In order to enforce the foregoing covenant, the Company may impose stop-transfer instructions with respect to the capital stock of the Company of each Lender (and the shares or securities of every other person subject to the foregoing restriction) until the end of such period.

Each Lender agrees that a legend reading substantially as follows shall be placed on all certificates representing all capital stock of the Company of each Lender (and the shares or securities of every other person subject to the restriction contained in this Section 8.11):

> THE SECURITIES REPRESENTED BY THIS CERTIFICATE ARE SUBJECT TO A LOCK-UP PERIOD AFTER THE EFFECTIVE DATE OF THE ISSUER'S REGISTRATION STATEMENT FILED UNDER THE SECURITIES ACT, AS AMENDED, AS SET FORTH IN AN AGREEMENT BETWEEN THE COMPANY AND THE ORIGINAL HOLDER OF THESE SECURITIES, A COPY OF WHICH MAY BE OBTAINED AT THE ISSUER'S PRINCIPAL OFFICE. SUCH LOCK-UP PERIOD IS BINDING ON TRANSFEREES OF THESE SHARES.

8.12 Financing Documents. Each Lender understands and agrees that the conversion of the Notes into Conversion Shares may require such Lender's execution of certain agreements in the form agreed to by investors in the Next Equity Financing or Non-Qualified Next Equity Financing relating to the purchase and sale of such securities as well as registration, co-sale, rights of first refusal, rights of first offer and voting rights, if any, relating to such securities; provided, however, that in no event shall conversion be conditioned upon any Lender be required to agree to undertake liability under any compelled voting (i.e., drag along provisions) for any third party (other than the Company) or that exceeds the consideration received or to be received by such party or to grant any proxy with respect to voting of shares.

8.13 MFN Right. In the event that the Company issues convertible notes (or similar convertible instruments) at any time after the date hereof which have terms that are more favorable to the Lenders than the terms of the Notes, such as, but not limited to, a higher interest rate, lower capped valuation or larger discount to the applicable conversion price, but which shall not include any Board representation or observer rights afforded to a specific Lender by reason of the magnitude of their investment (the "MFN Notes"), the Company shall promptly amend the terms of the Notes to provide substantially equivalent terms to the Lender as the MFN Notes without further consideration.

8.14 Exculpation Among Lenders. Each Lender acknowledges that it is not relying upon any person, firm, corporation or stockholder, other than the Company and its officers and directors in their capacities as such, in making its investment or decision to invest in

the Company. Each Lender agrees that no other Lender nor the respective controlling persons, officers, directors, partners, agents, stockholders or employees of any other Lender shall be liable for any action heretofore or hereafter taken or omitted to be taken by any of them in connection with the purchase and sale of the Securities.

8.15 Acknowledgement. In order to avoid doubt, it is acknowledged that each Lender shall be entitled to the benefit of all adjustments in the number of shares of Common Stock of the Company directly or indirectly issuable upon conversion of the Notes or as a result of any splits, recapitalizations, combinations or other similar transaction affecting the Common Stock or the Conversion Shares.

8.16 Indemnity; Costs, Expenses and Attorneys' Fees. The Company shall indemnify and hold each Lender harmless from any loss, cost, liability and legal or other expense, including attorneys' fees of such Lender's counsel, which a Lender may directly or indirectly suffer or incur by reason of the failure of the Company to perform any of its obligations under this Agreement, any Note, any agreement executed in connection herewith or therewith, any grant of or exercise of remedies with respect to any collateral at any time securing any obligations evidenced by this Agreement or the Notes, or any Lender's execution or performance of this Agreement or any agreement executed in connection herewith; provided, however, the indemnity agreement contained in this section shall not apply to liabilities which a Lender may directly or indirectly suffer or incur by reason of Lender's own gross negligence or willful misconduct.

8.17 Further Assurance. From time to time, the Company shall use its commercially reasonable efforts to execute and deliver to the Lenders such additional documents to the Lenders as the Requisite Noteholders may reasonably require to carry out the terms of this Agreement and the Notes and any agreements executed in connection herewith or therewith.

8.18 Dispute Resolution. The parties (a) hereby irrevocably and unconditionally submit to the jurisdiction of the state courts of State of Delaware and to the jurisdiction of the United States District Court for the District of Delaware for the purpose of any suit, action or other proceeding arising out of or based upon this Agreement, (b) agree not to commence any suit, action or other proceeding arising out of or based upon this Agreement except in the state courts of or the United States District Court for the District of Delaware, and (c) hereby waive, and agree not to assert, by way of motion, as a defense, or otherwise, in any such suit, action or proceeding, any claim that it is not subject personally to the jurisdiction of the foregoing courts, that its property is exempt or immune from attachment or execution, that the suit, action or proceeding is brought in an inconvenient forum, that the venue of the suit, action or proceeding is improper or that this Agreement or the subject matter hereof may not be enforced in or by such court.

8.19 Waiver of Jury Trial. TO THE EXTENT EACH MAY LEGALLY DO SO, EACH PARTY HERETO HEREBY EXPRESSLY WAIVES ANY RIGHT TO TRIAL BY JURY OF ANY CLAIM, DEMAND, ACTION, CAUSE OF ACTION, OR PROCEEDING ARISING UNDER OR WITH RESPECT TO THIS AGREEMENT, OR IN ANY WAY CONNECTED WITH, OR RELATED TO, OR INCIDENTAL TO, THE DEALING OF THE PARTIES HERETO WITH RESPECT TO THIS AGREEMENT, OR THE

TRANSACTIONS RELATED THERETO, IN EACH CASE WHETHER NOW EXISTING OR HEREAFTER ARISING, AND IRRESPECTIVE OF WHETHER SOUNDING IN CONTRACT, TORT, OR OTHERWISE. TO THE EXTENT EACH MAY LEGALLY DO SO, EACH PARTY HERETO HEREBY AGREES THAT ANY SUCH CLAIM, DEMAND, ACTION, OR PROCEEDING SHALL BE DECIDED BY A COURT TRIAL WITHOUT A JURY AND THAT EITHER PARTY HERETO MAY FILE AN ORIGINAL COUNTERPART OR A COPY OF THIS AGREEMENT WITH ANY COURT AS WRITTEN EVIDENCE OF THE CONSENT OF ANY OTHER PARTY HERETO TO THE WAIVER OF ITS RIGHT TO TRIAL BY JURY.

8.20 Survival. The representations, warranties, covenants and agreements made herein shall survive the closing of the transactions contemplated hereby.

8.21 Spousal Consent. If any individual Common Holder is married on the date of this Agreement, such Common Holder's spouse shall execute and deliver to the Company a consent of spouse in the form of Exhibit H hereto ("Consent of Spouse"), effective on the date hereof. Notwithstanding the execution and delivery thereof, such consent shall not be deemed to confer or convey to the spouse any rights in such Common Holder's Shares that do not otherwise exist by operation of law or the agreement of the parties. If any individual Common Holder should marry or remarry subsequent to the date of this Agreement, such Common Holder shall within thirty (30) days thereafter obtain his/her new spouse's acknowledgement of and consent to the existence and binding effect of all restrictions contained in this Agreement by causing such spouse to execute and deliver a Consent of Spouse acknowledging the restrictions and obligations contained in this Agreement and agreeing and consenting to the same.

8.22 Limitation of Liability; Freedom to Operate Affiliates.

(a) Other than as set forth below Section 8.22(b), the total liability, in the aggregate, of each Lender, and their respective Affiliates and their respective officers, directors, employees, consultants and agents, for any and all monetary claims, losses, costs or damages, including attorneys' and accountants' fees and expenses and costs of any nature whatsoever or claims or expenses resulting from or in any way related to this Agreement or the Notes from any cause or causes shall be several and not joint with the other Lenders and shall not exceed the total Consideration paid to the Company by such Lender for the Notes under this Agreement; provided, however, that this Section 8.22 shall (i) in no way limit the Company's right to equitable relief, including injunctive relief and specific performance from a Lender, (ii) apply to breaches of a Lender's confidentiality obligation, or (iii) limit liability for a Lender's conduct that is judicially determined to be bad faith, fraud or willful misconduct. Nothing in this Agreement or the Notes shall restrict a Lender's freedom to operate any of its Affiliates.

(b) Nothing in Section 8.22(a) shall modify any Lender's confidentiality obligations or the fiduciary duties of any director designated by Lender or the contractual restrictions on any Lender-designated Board observer.

[Signature pages follow.]

IN WITNESS WHEREOF, the parties have executed this Agreement as of the date first above written.

**PHATHOM PHARMACEUTICALS, INC.**

By: /s/ David Socks
Name: David Socks
Title: President and Chief Executive Officer

IN WITNESS WHEREOF, the parties have executed this Agreement as of the date first above written.

**LENDERS:**

**FRAZIER LIFE SCIENCES IX, L.P.**

By: FHMLS IX, L.P.
Its general partner

By: FHMLS IX, L.L.C.
Its general partner

By: /s/ James Topper
Name: James Topper
Title: Managing Director

Address: c/o Frazier Healthcare Partners
70 Willow Road, Suite 200
Menlo Park, CA 94025
Attn: James Topper

IN WITNESS WHEREOF, the parties have executed this Agreement as of the date first above written.

**LENDERS:**

**MEDICXI GROWTH CO-INVEST I LP**

By: its manager Medicxi Ventures Management (Jersey) Limited

/s/ Alex Di Santo
**Director**

**MEDICXI GROWTH I LP**

By: its manager Medicxi Ventures Management (Jersey) Limited

/s/ Alex Di Santo
**Director**

Address: Medicxi Ventures Management (Jersey) Limited
44 Esplanade
St Helier
Jersey JE4 9WG
Channel Islands

Attention: Giles Johnstone-Scott
Tel:
E-mail:

with mandatory copy to:

Medicxi Ventures (UK) LLP
25 Great Pulteney Street
London
W1F 9LT
Attention:
Email:

IN WITNESS WHEREOF, the parties have executed this Agreement as of the date first above written.

**LENDERS:**

**RA CAPITAL HEALTHCARE FUND, L.P.**

By: RA Capital Management, LLC
Its: General Partner

By: /s/ Natasha Kassian
Name: Natasha Kassian
Title: Authorized Signatory

Address: RA Capital Management, LLC
20 Park Plaza
Suite 1200
Boston, MA 02116
Attn: General Counsel

IN WITNESS WHEREOF, the parties have executed this Agreement as of the date first above written.

**LENDERS:**

**BLACKWELL PARTNERS LLC – SERIES A**

By: /s/ Adrienne C. Clough
Name: Adrienne C. Clough
Title: Investment Manager
DUMAC, Inc., Authorized Agent

By: /s/ Jannine M. Lall
Name: Jannine M. Lall
Title: Head of Finance & Controller
DUMAC, Inc., Authorized Agent

Address: Blackwell Partners LLC – Series A
280 S. Mangum Street
Suite 210
Durham, NC 27701
Attn: Jannine Lall

IN WITNESS WHEREOF, the parties have executed this Agreement as of the date first above written.

**LENDERS:**

**ABINGWORTH BIOVENTURES VII LP**
**acting by its Manager Abingworth LLP**

By: /s/ James Abell
Name: James Abell
Title: Partner

Address: c/o Abingworth LLP
38 Jermyn Street
London SW1Y 6DN
United Kingdom
Attn: General Counsel
Email:

IN WITNESS WHEREOF, the parties have executed this Agreement as of the date first above written.

**LENDERS:**

**JANUS HENDERSON GLOBAL LIFE SCIENCES FUND**

By: /s/ Andrew Acker
Name: Andrew Acker
Title: Portfolio Manager and Authorized Signatory

**JANUS HENDERSON CAPITAL FUNDS PLC ON BEHALF OF ITS SERIES JANUS HENDERSON GLOBAL LIFE SCIENCES FUND**

By: /s/ Andrew Acker
Name: Andrew Acker
Title: Portfolio Manager and Authorized Signatory

**JANUS HENDERSON HORIZON FUND – BIOTECHNOLOGY FUND**

By: /s/ Andrew Acker
Name: Andrew Acker
Title: Portfolio Manager and Authorized Signatory

Address: c/o Janus Capital Management LLC
151 Detroit Street
Denver, CO 80206
Boston, MA 02116
Attn: Andy Acker
Attn: Angela Morton
Email:

IN WITNESS WHEREOF, the parties have executed this Agreement as of the date first above written.

**LENDERS:**

**BIOTECHNOLOGY VALUE FUND, LP**

By: /s/ Mark Lampert
Name: Mark Lampert
Title: President BVF Inc., General Partner of BVF Partners L.P., itself GP of Biotechnology Value Fund, L.P.

Address:

44 Montgomery Street, 40th
Floor San Francisco, CA 94104

With a copy to (which shall not constitute notice):

Gibson, Dunn & Crutcher LLP
555 Mission Street, Suite 3000
San Francisco, CA 94105
Attention: Ryan A. Murr

IN WITNESS WHEREOF, the parties have executed this Agreement as of the date first above written.

**LENDERS:**

**BIOTECHNOLOGY VALUE FUND II, LP**

By: /s/ Mark Lampert
Name: Mark Lampert
Title: President BVF Inc., General Partner of BVF Partners L.P., itself GP of Biotechnology Value Fund II, L.P.

Address:

44 Montgomery Street, 40th
Floor San Francisco, CA 94104

With a copy to (which shall not constitute notice):

Gibson, Dunn & Crutcher LLP
555 Mission Street, Suite 3000
San Francisco, CA 94105
Attention: Ryan A. Murr

IN WITNESS WHEREOF, the parties have executed this Agreement as of the date first above written.

**LENDERS:**

**BIOTECHNOLOGY VALUE TRADING FUND OS, L.P.**

By: /s/ Mark Lampert
Name: Mark Lampert
Title: President BVF Inc., General Partner of BVF Partners L.P., itself sole member of BVF Partners OS Ltd., itself GP of Biotechnology Trading Fund OS, L.P.

Address:

PO Box 309 Ugland House, Grand Cayman,
KY1- 1104, Cayman Islands

With a copy to (which shall not constitute notice):

Gibson, Dunn & Crutcher LLP
555 Mission Street, Suite 3000
San Francisco, CA 94105
Attention: Ryan A. Murr

IN WITNESS WHEREOF, the parties have executed this Agreement as of the date first above written.

**LENDERS:**

**MSI BVF SPV, L.L.C.**

c/o Magnitude Capital

By: /s/ Mark Lampert
Name: Mark Lampert
Title: President BVF Inc., itself General Partner of BVF Partners L.P., itself attorney-in-fact for MSI BVF SPV, L.L.C.

Address:

200 Park Avenue, 56th Floor
New York, NY 10166

With a copy to (which shall not constitute notice):

Gibson, Dunn & Crutcher LLP
555 Mission Street, Suite 3000
San Francisco, CA 94105
Attention: Ryan A. Murr

IN WITNESS WHEREOF, the parties have executed this Agreement as of the date first above written.

**LENDERS:**

**RICHARD KING MELLON FOUNDATION**

By: /s/ Douglas L. Sisson
Name: Douglas L. Sisson
Title: Vice President and Treasurer

**MELLON FAMILY INVESTMENT COMPANY V**

By: its General Partner, MFIC V, LLC

By: /s/ Lawrence S. Busch
Name: Lawrence S. Busch
Title: Member

IN WITNESS WHEREOF, the parties have executed this Agreement as of the date first above written.

**LENDERS:**

**GREENSPRING EARLY STAGE I, L.P.**

By: Greenspring Early Stage General Partner I, L.P.
its general partner

By: Greenspring Early Stage GP I, LLC
its general partner

By: Greenspring Associates, Inc.
its sole member

By: /s/ Eric Thompson
Name: Eric Thompson
Title: Chief Operating Officer

IN WITNESS WHEREOF, the parties have executed this Agreement as of the date first above written.

**LENDERS:**

**GREENSPRING EARLY STAGE I-G, L.P.**

By: Greenspring Early Stage General Partner I, L.P.
its general partner

By: Greenspring Early Stage GP I, LLC
its general partner

By: Greenspring Associates, Inc.
its sole member

By: /s/ Eric Thompson
Name: Eric Thompson
Title: Chief Operating Officer

IN WITNESS WHEREOF, the parties have executed this Agreement as of the date first above written.

**LENDERS:**

**MARSHFIELD ADVISERS, LLC**

By: /s/ Scott Carman
Name: Scott Carman
Title: Head of Private Equity

Address:
Marshfield Advisers, LLC
60 East South Temple Street, Suite 400
Salt Lake City, UT 84111
Attn: Scott Carman, Head of Private Equity

IN WITNESS WHEREOF, the parties have executed this Agreement as of the date first above written.

**LENDERS:**

**CATALYS PACIFIC FUND, L.P.**

**General Partner:**

**Catalys Pacific Fund GP, L.P.**

By: Catalys Pacific, LLC, its general partner

By: /s/ Brian Taylor Slingsby
Name: Brian Taylor Slingsby, MD, PhD, MPH
Title: Managing Director

IN WITNESS WHEREOF, the parties have executed this Agreement as of the date first above written.

**LENDERS:**

**SAHSEN VENTURES, LLC**

By: /s/ Bryan White
Name: Bryan White
Title: Managing Member

Emails to:

With copies to:

IN WITNESS WHEREOF, the parties have executed this Agreement as of the date first above written.

**COMMON HOLDERS:**

David A. Socks 2013 Revocable Trust

By: /s/ David Socks
Name: David Socks
Title:

/s/ Tadataka Yamada
Tadataka Yamada

/s/ Azmi Nabulsi
Azmi Nabulsi

/s/ Roger Ulrich
Roger Ulrich

/s/ Aditya Kohli
Aditya Kohli

Executed as of the date first above written, solely with respect to Section 1(ff), Section 7.2, Section 7.4, Section 7.6 and Section 8.8 of this Agreement and not as a "Party" to this Agreement for any other reason:

**TAKEDA:**

Takeda Pharmaceutical Company Limited

By: /s/ Fumihiko Sato
Name: Fumihiko Sato
Title: Head of Portfolio Strategic Relations

**SCHEDULE OF LENDERS**

**INITIAL CLOSING**

| Lender | Total Consideration (Principal Balance of Promissory Note) |
|---|---|
| Frazier Life Sciences IX, L.P. | $ 2,427,747.62(1) |
| Frazier Life Sciences IX, L.P. | $ 17,572,252.38 |
| Medicxi Growth Co-Invest I LP | $ 348,076.92 |
| Medicxi Growth I LP | $ 14,651,923.08 |
| RA Capital Healthcare Fund, L.P. | $ 12,756,000.00 |
| Blackwell Partners LLC – Series A | $ 2,244,000.00 |
| Abingworth Bioventures VII LP | $ 10,000,000.00 |
| Janus Henderson Global Life Sciences Fund | $ 6,278,000.00 |
| Janus Henderson Capital Funds plc on behalf of its series Janus Henderson Global Life Sciences Fund | $ 3,634,000.00 |
| Janus Henderson Horizon Fund – Biotechnology Fund | $ 88,000.00 |
| Biotechnology Value Fund, LP | $ 3,708,000.00 |
| Biotechnology Value Fund II, LP | $ 2,996,000.00 |
| Biotechnology Value Trading Fund OS, LP | $ 536,000.00 |
| MSI BVF SPV L.L.C. | $ 260,000.00 |
| Richard King Mellon Foundation | $ 1,500,000.00 |
| Mellon Family Investment Company V | $ 1,500,000.00 |
| Greenspring Early Stage I, L.P. | $ 2,474,051.00 |
| Greenspring Early Stage I-G, L.P. | $ 525,949.00 |
| Marshfield Advisers, LLC | $ 2,500,000.00 |
| Sahsen Ventures, LLC | $ 750,000.00 |
| **INITIAL CLOSING TOTAL** | **$ 86,750,000.00** |

(1) The Consideration for this Note is an exchange for the existing convertible notes issued by the Company to Frazier as of the Initial Closing, which shall be null and void upon the issuance of the Note in the amount of $2,427,747.62, representing the principal and accrued interest on such convertible notes as of the Initial Closing.

**SECOND CLOSING**

| Lender | Total Consideration (Principal Balance of Promissory Note) |
|---|---|
| Catalys Pacific Fund, L.P. | $ 3,500,000.00 |
| **SECOND CLOSING TOTAL** | **$ 3,500,000.00** |
| **TOTAL FOR ALL CLOSINGS** | **$ 90,250,000.00** |

**PHATHOM PHARMACEUTICALS, INC.**

**AMENDMENT TO NOTE PURCHASE AGREEMENT**

This Amendment (this "Amendment") to the Note Purchase Agreement, dated as of May 7, 2019 (the "Purchase Agreement"), by and between Phathom Pharmaceuticals, Inc., a Delaware corporation (the "Company"), and the Lenders named on the Schedule of Lenders attached thereto, and the Common Holders, is made as of July 26, 2019 (the "Effective Date"). The Company, the Lenders and the Common Holders are sometimes referred to in this Amendment collectively as the "Parties" and individually as a "Party".

**WHEREAS**, pursuant to Section 8.8 of the Purchase Agreement any term of the Purchase Agreement may be amended and the observance of any term of the Purchase Agreement may be waived (either generally or in a particular instance and either retroactively or prospectively), with the written consent of the Company and the Requisite Noteholders;

**WHEREAS**, Section 7.4 of the Purchase Agreement shall not be amended or waived with respect to Takeda without the written consent of Takeda; and

**WHEREAS**, Takeda and the undersigned Lenders representing the Requisite Noteholders desire to amend the Purchase Agreement to provide for the termination of certain covenants contained in the Purchase Agreement upon the consummation of certain events.

**NOW, THEREFORE**, in consideration of the mutual covenants contained herein, and for other good and valuable consideration, the sufficiency of which is hereby acknowledged, the Parties agree as follows:

1. Definitions. Capitalized terms used but not defined in this Amendment shall have the meanings ascribed to them in the Purchase Agreement.

2. Amendments.

   (a) The following Section 7.3(f) is hereby added to the end of Section 7.3 of the Purchase Agreement:

   "(f) Termination. The covenants set forth in this Section 7.3 shall terminate and be of no further force or effect upon (i) the consummation of the Initial Public Offering, (ii) when the Company first becomes subject to the periodic reporting requirements of Sections 12(g) or 15(d) of the Exchange Act and (iii) upon the consummation of a Corporate Transaction, whichever event shall first occur."

   (b) The following Section 7.4(c) is hereby added to the end of Section 7.4 of the Purchase Agreement:

   "(c) Termination. This Section 7.4 shall be effective as of the date of this Agreement and shall continue in effect until and shall

terminate upon the earliest to occur of (i) the consummation of the Initial Public Offering, (ii) when the Company first becomes subject to the periodic reporting requirements of Sections 12(g) or 15(d) of the Exchange Act and (iii) upon the consummation of a Corporate Transaction; provided that the provisions of Section 7.4 hereof will continue after the closing of any Sale of the Company to the extent necessary to enforce the provisions of Section 7.4 with respect to such Sale of the Company."

(c) The following Section 7.9(d) is hereby added to the end of Section 7.9 of the Purchase Agreement:

"(d) Termination of Observer Rights. The rights described in this Section 7.9 shall terminate and be of no further force or effect upon (i) such time as Abingworth, RA Capital or Medicxi, as applicable, no longer hold a Note (or securities issued upon the conversion thereof) (ii) the consummation of the Initial Public Offering, (iii) when the Company first becomes subject to the periodic reporting requirements of Sections 12(g) or 15(d) of the Exchange Act and (iv) upon the consummation of a Corporate Transaction, whichever event shall first occur. The confidentiality obligations referenced in this Section 7.9 will survive for a period of five (5) years following any such termination."

3. Miscellaneous.

(a) Except as specifically provided for in this Amendment, all of the terms and conditions of the Purchase Agreement shall remain in full force and effect.

(b) This Amendment shall be governed by and construed under the laws of the State of Delaware as applied to agreements among Delaware residents, made and to be performed entirely within the State of Delaware, without regard to any choice of laws rules that may result in the application of the laws of any other jurisdiction.

(c) This Amendment may be executed by electronic signature and in two (2) or more counterparts, each of which shall be deemed an original, but all of which together shall constitute one (1) and the same instrument. Counterparts may be delivered by facsimile, electronic mail (including pdf) or other transmission method and any counterpart so delivered shall be deemed to have been duly and validly delivered and be valid and effective for all purposes.

[Signature pages follow]

IN WITNESS WHEREOF, the parties have executed this Amendment as of the date first above written.

**PHATHOM PHARMACEUTICALS, INC.**

By: /s/ David Socks
Name: David Socks
Title: President and Chief Executive Officer

IN WITNESS WHEREOF, the parties have executed this Amendment as of the date first above written.

**LENDERS:**

**FRAZIER LIFE SCIENCES IX, L.P.**

By: FHMLS IX, L.P.
Its general partner

By: FHMLS IX, L.L.C.
Its general partner

By: /s/ James Topper
Name: James Topper
Title: Managing Director

Address: c/o Frazier Healthcare Partners
70 Willow Road, Suite 200
Menlo Park, CA 94025
Attn: James Topper

IN WITNESS WHEREOF, the parties have executed this Amendment as of the date first above written.

**LENDERS:**

**MEDICXI GROWTH CO-INVEST I LP**

By: its manager Medicxi Ventures Management (Jersey) Limited

/s/ Nick McHardy
**Director**

**MEDICXI GROWTH I LP**

By: its manager Medicxi Ventures Management (Jersey) Limited

/s/ Nick McHardy
**Director**

Address: Medicxi Ventures Management (Jersey) Limited
44 Esplanade
St Helier
Jersey JE4 9WG
Channel Islands

Attention: Giles Johnstone-Scott
Tel:
E-mail:

with mandatory copy to:

Medicxi Ventures (UK) LLP
25 Great Pulteney Street
London
W1F 9LT
Attention:
Email:

IN WITNESS WHEREOF, the parties have executed this Amendment as of the date first above written.

**LENDERS:**

**RA CAPITAL HEALTHCARE FUND, L.P.**

By: RA Capital Management, LLC
Its: General Partner

By: /s/ Peter Kolchinsky
Name: Peter Kolchinsky
Title: Authorized Signatory

Address: RA Capital Management, LLC
20 Park Plaza
Suite 1200
Boston, MA 02116
Attn: General Counsel

IN WITNESS WHEREOF, the parties have executed this Amendment as of the date first above written.

**LENDERS:**

**BLACKWELL PARTNERS LLC – SERIES A**

By: /s/ Abayomi A. Adigun
Name: Abayomi A. Adigun
Title: Investment Manager
DUMAC, Inc.
Authorized Agent

By: /s/ Jannine M. Lall
Name: Jannine M. Lall
Title: Head of Finance & Controller
DUMAC, Inc.
Authorized Agent

Address: Blackwell Partners LLC – Series A
280 S. Mangum Street
Suite 210
Durham, NC 27701
Attn: Jannine Lall

IN WITNESS WHEREOF, the parties have executed this Amendment as of the date first above written.

**LENDERS:**

**ABINGWORTH BIOVENTURES VII LP**
**acting by its Manager Abingworth LLP**

By: /s/ John Heard
Name: John Heard
Title: General Counsel

Address: c/o Abingworth LLP
38 Jermyn Street
London SW1Y 6DN
United Kingdom
Attn: General Counsel
Email:

IN WITNESS WHEREOF, the parties have executed this Amendment as of the date first above written.

**COMMON HOLDERS:**

David A. Socks 2013 Revocable Trust

By: /s/ David Socks
Name: David Socks
Title: Trustee

/s/ Tadataka Yamada
Tadataka Yamada

/s/ Azmi Nabulsi
Azmi Nabulsi

/s/ Roger Ulrich
Roger Ulrich

/s/ Aditya Kohli
Aditya Kohli

Executed as of the date first above written, solely with respect to Section 7.4 and Section 8.8 of the Purchase Agreement and not as a "Party" to this Amendment for any other reason:

**TAKEDA PHARMACEUTICAL COMPANY LIMITED:**

Takeda Pharmaceutical Company Limited

By: /s/ Fumihiko Sato
Name: Fumihiko Sato
Title: Head of Portfolio Strategic Relations

**PHATHOM PHARMACEUTICALS, INC.**

**AMENDMENT #2 TO NOTE PURCHASE AGREEMENT**

This Amendment #2 (this "Amendment") to the Note Purchase Agreement, dated as of May 7, 2019 (as amended by the Amendment to Note Purchase Agreement, dated as of July 26, 2019, the "Purchase Agreement"), by and between Phathom Pharmaceuticals, Inc., a Delaware corporation (the "Company"), and the Lenders named on the Schedule of Lenders attached thereto, and the Common Holders, is made as of September 26, 2019 (the "Effective Date"). The Company, the Lenders and the Common Holders are sometimes referred to in this Amendment collectively as the "Parties" and individually as a "Party".

**WHEREAS**, pursuant to Section 8.8 of the Purchase Agreement any term of the Purchase Agreement may be amended and the observance of any term of the Purchase Agreement may be waived (either generally or in a particular instance and either retroactively or prospectively), with the written consent of the Company and the Requisite Noteholders;

**WHEREAS**, Section 7.6(b)(iii) of the Purchase Agreement shall not be amended or waived with respect to Takeda without the written consent of Takeda; and

**WHEREAS**, Takeda and the undersigned Lenders representing the Requisite Noteholders desire to amend the Purchase Agreement to provide for an increase in the authorized size of the Board and to amend the composition of the Board.

**NOW, THEREFORE**, in consideration of the mutual covenants contained herein, and for other good and valuable consideration, the sufficiency of which is hereby acknowledged, the Parties agree as follows:

1. Definitions. Capitalized terms used but not defined in this Amendment shall have the meanings ascribed to them in the Purchase Agreement.

2. Amendments.

(a) Section 7.6(a) and Section 7.6(b) are hereby amended and restated in their entirety as follows:

"7.6 Voting Provisions Regarding the Board Provisions.

(a) Each Common Holder, Takeda and Frazier agrees to vote, or cause to be voted, all Shares owned by such Common Holder, Takeda and Frazier, or over which such Common Holder, Takeda and Frazier has voting control, from time to time and at all times, in whatever manner as shall be necessary to ensure that the size of the Board shall be set and remain at eight (8) directors.

(b) Each Common Holder, Takeda and Frazier agrees to vote, or cause to be voted, all Shares owned by such Common Holder, Takeda and Frazier, or over which such Stockholder has voting control, from time to time and at all times, in whatever manner as shall be necessary to ensure that at each annual or special meeting of stockholders at which an election of directors is held or pursuant to

any written consent of the stockholders, the following persons shall be elected to the Board:

(i) One (1) person designated from time to time by Frazier, who shall initially be James Topper;

(ii) One (1) person designated from time to time by the Lenders other than Frazier, which individual shall initially be Jon Edwards;

(iii) One (1) person designated from time to time by Takeda or its affiliates, which individual shall initially be Chris Slavinsky;

(iv) One (1) person designated from time to time by the holders of a majority of the Common Stock, which individual shall initially be Tadataka Yamada, M.D. (who shall initially be the Chairman of the Board);

(v) The Company's Chief Executive Officer, who shall initially be David Socks (the "CEO Director"), provided that if for any reason the CEO Director shall cease to serve as the Chief Executive Officer of the Company, each of the Common Holders shall promptly vote their respective Shares (A) to remove the former Chief Executive Officer of the Company from the Board if such person has not resigned as a member of the Board; and (B) to elect such person's replacement as Chief Executive Officer of the Company as the new CEO Director; and

(vi) Three (3) individuals not otherwise an Affiliate of the Company or of any Lender who is mutually acceptable to the other members of the Board, which individuals shall initially be Michael Cola, Terrie Curran and Heidi Kuntz."

(b) Section 1(cc)(iii) is hereby amended and restated in its entirety as follows:

"(iii) the number of shares of capital stock (determined on an as converted to Common Stock basis) reserved for issuance under the Company's equity incentive plans (net of any such shares underlying securities included in clause (ii) of this definition) including, in the event of a conversion of the Notes in the Next Equity Financing, any increase in the number of such reserved shares expressly required by the terms and conditions of such Next Equity Financing; provided that, for clarity, any shares reserved as part of an equity incentive plan or employee stock purchase plan adopted in connection with an Initial Public Offering shall not be included in this clause (iii)."

3. Miscellaneous.

(a) Except as specifically provided for in this Amendment, all of the terms and conditions of the Purchase Agreement shall remain in full force and effect.

(b) This Amendment shall be governed by and construed under the laws of the State of Delaware as applied to agreements among Delaware residents, made and to be

performed entirely within the State of Delaware, without regard to any choice of laws rules that may result in the application of the laws of any other jurisdiction.

(c) This Amendment may be executed by electronic signature and in two (2) or more counterparts, each of which shall be deemed an original, but all of which together shall constitute one (1) and the same instrument. Counterparts may be delivered by facsimile, electronic mail (including pdf) or other transmission method and any counterpart so delivered shall be deemed to have been duly and validly delivered and be valid and effective for all purposes.

[Signature pages follow]

IN WITNESS WHEREOF, the parties have executed this Amendment as of the date first above written.

**PHATHOM PHARMACEUTICALS, INC.**

By: /s/ David Socks
Name: David Socks
Title: President and Chief Executive Officer

*(Signature Page to the Amendment to the Note Purchase Agreement)*

IN WITNESS WHEREOF, the parties have executed this Amendment as of the date first above written.

**LENDERS:**

**FRAZIER LIFE SCIENCES IX, L.P.**

By: FHMLS IX, L.P.
Its general partner

By: FHMLS IX, L.L.C.
Its general partner

By: /s/ James Topper
Name: James Topper
Title: Managing Director

Address: c/o Frazier Healthcare Partners
70 Willow Road, Suite 200
Menlo Park, CA 94025
Attn: James Topper

IN WITNESS WHEREOF, the parties have executed this Amendment as of the date first above written.

**LENDERS:**

**MEDICXI GROWTH CO-INVEST I LP**

By: its manager Medicxi Ventures Management (Jersey) Limited

/s/ Alex Di Santo

**Alex Di Santo**
**Director**

**MEDICXI GROWTH I LP**

By: its manager Medicxi Ventures Management (Jersey) Limited

/s/ Alex Di Santo

**Alex Di Santo**
**Director**

Address: Medicxi Ventures Management (Jersey) Limited
44 Esplanade
St Helier
Jersey JE4 9WG
Channel Islands

Attention: Giles Johnstone-Scott
Tel:
E-mail:

with mandatory copy to:

Medicxi Ventures (UK) LLP
25 Great Pulteney Street
London
W1F 9LT
Attention: Richard Lee
Email:

IN WITNESS WHEREOF, the parties have executed this Amendment as of the date first above written.

**LENDERS:**

**RA CAPITAL HEALTHCARE FUND, L.P.**

By: RA Capital Management, LLC
Its: General Partner

By: /s/ Peter Kolchinsky
Name: Peter Kolchinsky
Title: Authorized Signatory

Address: RA Capital Management, LLC
20 Park Plaza
Suite 1200
Boston, MA 02116
Attn: General Counsel

IN WITNESS WHEREOF, the parties have executed this Amendment as of the date first above written.

**LENDERS:**

**BLACKWELL PARTNERS LLC – SERIES A**

By: /s/ Abayomi A. Adigun
Name: Abayomi A. Adigun
Title: Investment Manager
DUMAC, Inc.
Authorized Agent

By: /s/ Jannine M. Lall
Name: Jannine M. Lall
Title: Head of Finance & Controller
DUMAC, Inc.
Authorized Agent

Address: Blackwell Partners LLC – Series A
280 S. Mangum Street
Suite 210
Durham, NC 27701
Attn: Jannine Lall

*(Signature Page to the Amendment to the Note Purchase Agreement)*

IN WITNESS WHEREOF, the parties have executed this Amendment as of the date first above written.

**LENDERS:**

**ABINGWORTH BIOVENTURES VII LP**
**acting by its Manager Abingworth LLP**

By: /s/ James Abell
Name: James Abell
Title: Partner

Address: c/o Abingworth LLP
38 Jermyn Street
London SW1Y 6DN
United Kingdom
Attn: General Counsel
Email:

*(Signature Page to the Amendment to the Note Purchase Agreement)*

IN WITNESS WHEREOF, the parties have executed this Amendment as of the date first above written.

**COMMON HOLDERS:**

David A. Socks 2013 Revocable Trust

By: /s/ David Socks
Name: David Socks
Title: Trustee

/s/ Tadataka Yamada
Tadataka Yamada

/s/ Azmi Nabulsi
Azmi Nabulsi

/s/ Roger Ulrich
Roger Ulrich

/s/ Aditya Kohli
Aditya Kohli

*(Signature Page to the Amendment to the Note Purchase Agreement)*

Executed as of the date first above written, solely with respect to Section 7.6(b)(iii) and Section 8.8 of the Purchase Agreement and not as a "Party" to this Amendment for any other reason:

**TAKEDA:**

Takeda Pharmaceutical Company Limited

By: /s/ Chris Slavinsky
Name: Chris Slavinsky
Title: VP, Center for External Innovation

*(Signature Page to the Amendment to the Note Purchase Agreement)*

**Exhibit 5.1**

LATHAM & WATKINS LLP

12670 High Bluff Drive,
San Diego, California 92130
Tel: +1.858.523.5400 Fax: +1.858.523.5450
www.lw.com

FIRM / AFFILIATE OFFICES

| | |
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| Dubai | Riyadh |
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| Frankfurt | San Diego |
| Hamburg | San Francisco |
| Hong Kong | Shanghai |
| Houston | Silicon Valley |
| London | Singapore |
| Los Angeles | Tokyo |
| Madrid | Washington, D.C. |


October 15, 2019

Phathom Pharmaceuticals, Inc.
2150 E. Lake Cook Road, Suite 800
Buffalo Grove, Illinois 60089

Re: Registration Statement No. 333-234020; 9,085,000 shares of Common Stock, par value $0.0001 per share

Ladies and Gentlemen:

We have acted as special counsel to Phathom Pharmaceuticals, Inc., a Delaware corporation (the "Company"), in connection with the proposed issuance of up to 9,085,000 shares (including up to 1,185,000 shares subject to the underwriters' option to purchase additional shares) of common stock, $0.0001 par value per share (the "Shares"). The Shares are included in a registration statement on Form S-1 under the Securities Act of 1933, as amended (the "Act"), filed with the Securities and Exchange Commission (the "Commission") on September 30, 2019 (File No. 333-234020) (as amended, the "Registration Statement"). The term "Shares" shall include any additional shares of common stock registered by the Company pursuant to Rule 462(b) under the Act in connection with the offering contemplated by the Registration Statement. This opinion is being furnished in connection with the requirements of Item 601(b)(5) of Regulation S-K under the Act, and no opinion is expressed herein as to any matter pertaining to the contents of the Registration Statement or related Prospectus, other than as expressly stated herein with respect to the issue of the Shares.

As such counsel, we have examined such matters of fact and questions of law as we have considered appropriate for purposes of this letter. With your consent, we have relied upon certificates and other assurances of officers of the Company and others as to factual matters without having independently verified such factual matters. We are opining herein as to the General Corporation Law of the State of Delaware and we express no opinion with respect to any other laws.

Subject to the foregoing and the other matters set forth herein, it is our opinion that, as of the date hereof, when the Shares shall have been duly registered on the books of the transfer agent and registrar therefor in the name or on behalf of the purchasers, and have been issued by the Company against payment therefor in the circumstances contemplated by the form of underwriting agreement most recently filed as an exhibit to the Registration Statement, the issue and sale of the Shares will have been duly authorized by all necessary corporate action of the Company, and the Shares will be validly issued, fully paid and nonassessable. In rendering the foregoing opinion, we have assumed that the Company will comply with all applicable notice requirements regarding uncertificated shares provided in the General Corporation Law of the State of Delaware.

LATHAM & WATKINS LLP

This opinion is for your benefit in connection with the Registration Statement and may be relied upon by you and by persons entitled to rely upon it pursuant to the applicable provisions of the Act. We consent to your filing this opinion as an exhibit to the Registration Statement and to the reference to our firm in the Prospectus under the heading "Legal Matters." We further consent to the incorporation by reference of this letter and consent into any registration statement filed pursuant to Rule 462(b) with respect to the Shares. In giving such consent, we do not thereby admit that we are in the category of persons whose consent is required under Section 7 of the Act or the rules and regulations of the Commission thereunder.

Very truly yours,

/s/ Latham & Watkins LLP

**PHATHOM PHARMACEUTICALS, INC.**

**2019 INCENTIVE AWARD PLAN**

## ARTICLE I.
## PURPOSE

The Plan's purpose is to enhance the Company's ability to attract, retain and motivate persons who make (or are expected to make) important contributions to the Company by providing these individuals with equity ownership opportunities. Capitalized terms used in the Plan are defined in Article XI.

## ARTICLE II.
## ELIGIBILITY

Service Providers are eligible to be granted Awards under the Plan, subject to the limitations described herein.

## ARTICLE III.
## ADMINISTRATION AND DELEGATION

3.1 Administration. The Plan is administered by the Administrator. The Administrator has authority to determine which Service Providers receive Awards, grant Awards and set Award terms and conditions, subject to the conditions and limitations in the Plan. The Administrator also has the authority to take all actions and make all determinations under the Plan, to interpret the Plan and Award Agreements and to adopt, amend and repeal Plan administrative rules, guidelines and practices as it deems advisable. The Administrator may correct defects and ambiguities, supply omissions and reconcile inconsistencies in the Plan or any Award as it deems necessary or appropriate to administer the Plan and any Awards. The Administrator's determinations under the Plan are in its sole discretion and will be final and binding on all persons having or claiming any interest in the Plan or any Award.

3.2 Appointment of Committees. To the extent Applicable Laws permit, the Board may delegate any or all of its powers under the Plan to one or more Committees or officers of the Company or any of its Subsidiaries. The Board may abolish any Committee or re-vest in itself any previously delegated authority at any time.

## ARTICLE IV.
## STOCK AVAILABLE FOR AWARDS

4.1 Number of Shares. Subject to adjustment under Article VIII and the terms of this Article IV, Awards may be made under the Plan covering up to the Overall Share Limit. As of the Plan's effective date under Section 10.3, the Company will cease granting awards under the Prior Plan; however, Prior Plan Awards will remain subject to the terms of the applicable Prior Plan. Shares issued under the Plan may consist of authorized but unissued Shares, Shares purchased on the open market or treasury Shares.

4.2 Share Recycling. If all or any part of an Award or Prior Plan Award expires, lapses or is terminated, exchanged for cash, surrendered, repurchased, canceled without having been fully exercised or forfeited, in any case, in a manner that results in the Company acquiring Shares covered by the Award or

Prior Plan Award at a price not greater than the price (as adjusted to reflect any Equity Restructuring) paid by the Participant for such Shares or not issuing any Shares covered by the Award or Prior Plan Award, the unused Shares covered by the Award or Prior Plan Award will, as applicable, become or again be available for Award grants under the Plan. Further, Shares delivered (either by actual delivery or attestation) to the Company by a Participant to satisfy the applicable exercise or purchase price of an Award or Prior Plan Award and/or to satisfy any applicable tax withholding obligation (including Shares retained by the Company from the Award or Prior Plan Award being exercised or purchased and/or creating the tax obligation) will, as applicable, become or again be available for Award grants under the Plan. The payment of Dividend Equivalents in cash in conjunction with any outstanding Awards or Prior Plan Awards shall not count against the Overall Share Limit.

4.3 Incentive Stock Option Limitations. Notwithstanding anything to the contrary herein, no more than 40,000,000 Shares may be issued pursuant to the exercise of Incentive Stock Options.

4.4 Substitute Awards. In connection with an entity's merger or consolidation with the Company or the Company's acquisition of an entity's property or stock, the Administrator may grant Awards in substitution for any options or other stock or stock-based awards granted before such merger or consolidation by such entity or its affiliate. Substitute Awards may be granted on such terms as the Administrator deems appropriate, notwithstanding limitations on Awards in the Plan. Substitute Awards will not count against the Overall Share Limit (nor shall Shares subject to a Substitute Award be added to the Shares available for Awards under the Plan as provided above), except that Shares acquired by exercise of substitute Incentive Stock Options will count against the maximum number of Shares that may be issued pursuant to the exercise of Incentive Stock Options under the Plan. Additionally, in the event that a company acquired by the Company or any Subsidiary or with which the Company or any Subsidiary combines has shares available under a pre-existing plan approved by stockholders and not adopted in contemplation of such acquisition or combination, the shares available for grant pursuant to the terms of such pre-existing plan (as adjusted, to the extent appropriate, using the exchange ratio or other adjustment or valuation ratio or formula used in such acquisition or combination to determine the consideration payable to the holders of common stock of the entities party to such acquisition or combination) may be used for Awards under the Plan and shall not reduce the Shares authorized for grant under the Plan (and Shares subject to such Awards shall not be added to the Shares available for Awards under the Plan as provided above); provided that Awards using such available shares shall not be made after the date awards or grants could have been made under the terms of the pre-existing plan, absent the acquisition or combination, and shall only be made to individuals who were not Employees or Directors prior to such acquisition or combination.

4.5 Non-Employee Director Compensation. Notwithstanding any provision to the contrary in the Plan, the Administrator may establish compensation for non-employee Directors from time to time, subject to the limitations in the Plan. The Administrator will from time to time determine the terms, conditions and amounts of all such non-employee Director compensation in its discretion and pursuant to the exercise of its business judgment, taking into account such factors, circumstances and considerations as it shall deem relevant from time to time, provided that the sum of any cash compensation, or other compensation, and the value (determined as of the grant date in accordance with Financial Accounting Standards Board Accounting Standards Codification Topic 718, or any successor thereto) of Awards granted to a non-employee Director as compensation for services as a non-employee Director during any fiscal year of the Company may not exceed $750,000 increased to $1,000,000 in the fiscal year of a non-employee Director's initial service as a non-employee Director. The Administrator may make exceptions to this limit for individual non-employee Directors in extraordinary circumstances, as the Administrator may determine in its discretion, provided that the non-employee Director receiving such additional compensation may not participate in the decision to award such compensation or in other contemporaneous compensation decisions involving non-employee Directors.

**ARTICLE V.**
**STOCK OPTIONS AND STOCK APPRECIATION RIGHTS**

5.1 General. The Administrator may grant Options or Stock Appreciation Rights to Service Providers subject to the limitations in the Plan, including any limitations in the Plan that apply to Incentive Stock Options. The Administrator will determine the number of Shares covered by each Option and Stock Appreciation Right, the exercise price of each Option and Stock Appreciation Right and the conditions and limitations applicable to the exercise of each Option and Stock Appreciation Right. A Stock Appreciation Right will entitle the Participant (or other person entitled to exercise the Stock Appreciation Right) to receive from the Company upon exercise of the exercisable portion of the Stock Appreciation Right an amount determined by multiplying the excess, if any, of the Fair Market Value of one Share on the date of exercise over the exercise price per Share of the Stock Appreciation Right by the number of Shares with respect to which the Stock Appreciation Right is exercised, subject to any limitations of the Plan or that the Administrator may impose and payable in cash, Shares valued at Fair Market Value or a combination of the two as the Administrator may determine or provide in the Award Agreement.

5.2 Exercise Price. The Administrator will establish each Option's and Stock Appreciation Right's exercise price and specify the exercise price in the Award Agreement. The exercise price will not be less than 100% of the Fair Market Value on the grant date of the Option or Stock Appreciation Right.

5.3 Duration. Each Option or Stock Appreciation Right will be exercisable at such times and as specified in the Award Agreement, provided that the term of an Option or Stock Appreciation Right will not exceed ten years. Notwithstanding the foregoing and unless determined otherwise by the Company, in the event that on the last business day of the term of an Option or Stock Appreciation Right (other than an Incentive Stock Option) (i) the exercise of the Option or Stock Appreciation Right is prohibited by Applicable Law, as determined by the Company, or (ii) Shares may not be purchased or sold by the applicable Participant due to any Company insider trading policy (including blackout periods) or a "lock-up" agreement undertaken in connection with an issuance of securities by the Company, the term of the Option or Stock Appreciation Right shall be extended until the date that is thirty (30) days after the end of the legal prohibition, black-out period or lock-up agreement, as determined by the Company; provided, however, in no event shall the extension last beyond the ten year term of the applicable Option or Stock Appreciation Right. Notwithstanding the foregoing, if the Participant, prior to the end of the term of an Option or Stock Appreciation Right, violates the non-competition, non-solicitation, confidentiality or other similar restrictive covenant provisions of any employment contract, confidentiality and nondisclosure agreement or other agreement between the Participant and the Company or any of its Subsidiaries, the right of the Participant and the Participant's transferees to exercise any Option or Stock Appreciation Right issued to the Participant shall terminate immediately upon such violation, unless the Company otherwise determines. In addition, if, prior to the end of the term of an Option or Stock Appreciation Right, the Participant is given notice by the Company or any of its Subsidiaries of the Participant's Termination of Service by the Company or any of its Subsidiaries for Cause, and the effective date of such Termination of Service is subsequent to the date of the delivery of such notice, the right of the Participant and the Participant's transferees to exercise any Option or Stock Appreciation Right issued to the Participant shall be suspended from the time of the delivery of such notice until the earlier of (i) such time as it is determined or otherwise agreed that the Participant's service as a Service Provider will not be terminated for Cause as provided in such notice or (ii) the effective date of the Participant's Termination of Service by the Company or any of its Subsidiaries for Cause (in which case the right of the Participant and the Participant's transferees to exercise any Option or Stock Appreciation Right issued to the Participant will terminate immediately upon the effective date of such termination of Service).

5.4 Exercise. Options and Stock Appreciation Rights may be exercised by delivering to the Company a written notice of exercise, in a form the Administrator approves (which may be electronic),

signed by the person authorized to exercise the Option or Stock Appreciation Right, together with, as applicable, payment in full (i) as specified in Section 5.5 for the number of Shares for which the Award is exercised and (ii) as specified in Section 9.5 for any applicable taxes. Unless the Administrator otherwise determines, an Option or Stock Appreciation Right may not be exercised for a fraction of a Share.

5.5 Payment Upon Exercise. Subject to Section 10.8, any Company insider trading policy (including blackout periods) and Applicable Laws, the exercise price of an Option must be paid by:

(a) cash, wire transfer of immediately available funds or by check payable to the order of the Company, provided that the Company may limit the use of one of the foregoing payment forms if one or more of the payment forms below is permitted;

(b) if there is a public market for Shares at the time of exercise, unless the Company otherwise determines, (A) delivery (including electronically or telephonically to the extent permitted by the Company) of an irrevocable and unconditional undertaking by a broker acceptable to the Company to deliver promptly to the Company sufficient funds to pay the exercise price, or (B) the Participant's delivery to the Company of a copy of irrevocable and unconditional instructions to a broker acceptable to the Company to deliver promptly to the Company cash or a check sufficient to pay the exercise price; provided that such amount is paid to the Company at such time as may be required by the Administrator;

(c) to the extent permitted by the Administrator, delivery (either by actual delivery or attestation) of Shares owned by the Participant valued at their Fair Market Value;

(d) to the extent permitted by the Administrator, surrendering Shares then issuable upon the Option's exercise valued at their Fair Market Value on the exercise date;

(e) to the extent permitted by the Administrator, delivery of a promissory note or any other property that the Administrator determines is good and valuable consideration; or

(f) to the extent permitted by the Company, any combination of the above payment forms approved by the Administrator.

## ARTICLE VI.
## RESTRICTED STOCK; RESTRICTED STOCK UNITS

6.1 General. The Administrator may grant Restricted Stock, or the right to purchase Restricted Stock, to any Service Provider, subject to the Company's right to repurchase all or part of such shares at their issue price or other stated or formula price from the Participant (or to require forfeiture of such shares) if conditions the Administrator specifies in the Award Agreement are not satisfied before the end of the applicable restriction period or periods that the Administrator establishes for such Award. In addition, the Administrator may grant to Service Providers Restricted Stock Units, which may be subject to vesting and forfeiture conditions during the applicable restriction period or periods, as set forth in an Award Agreement. The Administrator will determine and set forth in the Award Agreement the terms and conditions for each Restricted Stock and Restricted Stock Unit Award, subject to the conditions and limitations contained in the Plan.

6.2 Restricted Stock.

(a) Dividends. Participants holding shares of Restricted Stock will be entitled to all ordinary cash dividends paid with respect to such Shares, unless the Administrator provides otherwise in the Award Agreement. In addition, unless the Administrator provides otherwise, if any dividends or

distributions are paid in Shares, or consist of a dividend or distribution to holders of Common Stock of property other than an ordinary cash dividend, the Shares or other property will be subject to the same restrictions on transferability and forfeitability as the shares of Restricted Stock with respect to which they were paid.

(b) Stock Certificates. The Company may require that the Participant deposit in escrow with the Company (or its designee) any stock certificates issued in respect of shares of Restricted Stock, together with a stock power endorsed in blank.

6.3 Restricted Stock Units.

(a) Settlement. The Administrator may provide that settlement of Restricted Stock Units will occur upon or as soon as reasonably practicable after the Restricted Stock Units vest or will instead be deferred, on a mandatory basis or at the Participant's election, in a manner intended to comply with Section 409A.

(b) Stockholder Rights. A Participant will have no rights of a stockholder with respect to Shares subject to any Restricted Stock Unit unless and until the Shares are delivered in settlement of the Restricted Stock Unit.

(c) Dividend Equivalents. If the Administrator provides, a grant of Restricted Stock Units may provide a Participant with the right to receive Dividend Equivalents. Dividend Equivalents may be paid currently or credited to an account for the Participant, settled in cash or Shares and subject to the same restrictions on transferability and forfeitability as the Restricted Stock Units with respect to which the Dividend Equivalents are granted and subject to other terms and conditions as set forth in the Award Agreement.

## ARTICLE VII.
## OTHER STOCK OR CASH BASED AWARDS

Other Stock or Cash Based Awards may be granted to Participants, including Awards entitling Participants to receive Shares to be delivered in the future and including annual or other periodic or long-term cash bonus awards (whether based on specified Performance Criteria or otherwise), in each case subject to any conditions and limitations in the Plan. Such Other Stock or Cash Based Awards will also be available as a payment form in the settlement of other Awards, as standalone payments and as payment in lieu of compensation to which a Participant is otherwise entitled. Other Stock or Cash Based Awards may be paid in Shares, cash or other property, as the Administrator determines. Subject to the provisions of the Plan, the Administrator will determine the terms and conditions of each Other Stock or Cash Based Award, including any purchase price, performance goal (which may be based on the Performance Criteria), transfer restrictions, and vesting conditions, which will be set forth in the applicable Award Agreement.

## ARTICLE VIII.
## ADJUSTMENTS FOR CHANGES IN COMMON STOCK AND CERTAIN OTHER EVENTS

8.1 Equity Restructuring(a). In connection with any Equity Restructuring, notwithstanding anything to the contrary in this Article VIII, the Administrator will equitably adjust each outstanding Award as it deems appropriate to reflect the Equity Restructuring, which may include adjusting the number and type of securities subject to each outstanding Award and/or the Award's exercise price or grant price (if applicable), granting new Awards to Participants, and making a cash payment to Participants. The adjustments provided under this Section 8.1 will be nondiscretionary and final and binding on the affected

Participant and the Company; provided that the Administrator will determine whether an adjustment is equitable.

8.2 Corporate Transactions. In the event of any dividend or other distribution (whether in the form of cash, Common Stock, other securities, or other property), reorganization, merger, consolidation, combination, amalgamation, repurchase, recapitalization, liquidation, dissolution, or sale, transfer, exchange or other disposition of all or substantially all of the assets of the Company, or sale or exchange of Common Stock or other securities of the Company, Change in Control, issuance of warrants or other rights to purchase Common Stock or other securities of the Company, other similar corporate transaction or event, other unusual or nonrecurring transaction or event affecting the Company or its financial statements or any change in any Applicable Laws or accounting principles, the Administrator, on such terms and conditions as it deems appropriate, either by the terms of the Award or by action taken prior to the occurrence of such transaction or event (except that action to give effect to a change in Applicable Law or accounting principles may be made within a reasonable period of time after such change) and either automatically or upon the Participant's request, is hereby authorized to take any one or more of the following actions whenever the Administrator determines that such action is appropriate in order to (x) prevent dilution or enlargement of the benefits or potential benefits intended by the Company to be made available under the Plan or with respect to any Award granted or issued under the Plan, (y) to facilitate such transaction or event or (z) give effect to such changes in Applicable Laws or accounting principles:

(a) To provide for the cancellation of any such Award in exchange for either an amount of cash or other property with a value equal to the amount that could have been obtained upon the exercise or settlement of the vested portion of such Award or realization of the Participant's rights under the vested portion of such Award, as applicable; provided that, if the amount that could have been obtained upon the exercise or settlement of the vested portion of such Award or realization of the Participant's rights, in any case, is equal to or less than zero, then the Award may be terminated without payment;

(b) To provide that such Award shall vest and, to the extent applicable, be exercisable as to all shares covered thereby, notwithstanding anything to the contrary in the Plan or the provisions of such Award;

(c) To provide that such Award be assumed by the successor or survivor corporation, or a parent or subsidiary thereof, or shall be substituted for by awards covering the stock of the successor or survivor corporation, or a parent or subsidiary thereof, with appropriate adjustments as to the number and kind of shares and/or applicable exercise or purchase price, in all cases, as determined by the Administrator;

(d) To make adjustments in the number and type of shares of Common Stock (or other securities or property) subject to outstanding Awards and/or with respect to which Awards may be granted under the Plan (including, but not limited to, adjustments of the limitations in Article IV hereof on the maximum number and kind of shares which may be issued) and/or in the terms and conditions of (including the grant or exercise price), and the criteria included in, outstanding Awards;

(e) To replace such Award with other rights or property selected by the Administrator; and/or

(f) To provide that the Award will terminate and cannot vest, be exercised or become payable after the applicable event.

8.3 Effect of Non-Assumption in a Change in Control. Notwithstanding the provisions of Section 8.2, if a Change in Control occurs and a Participant's Awards are not continued, converted,

assumed, or replaced with a substantially similar award by (a) the Company, or (b) a successor entity or its parent or subsidiary (an "***Assumption***"), and provided that the Participant has not had a Termination of Service, then, immediately prior to the Change in Control, such Awards shall become fully vested, exercisable and/or payable, as applicable, and all forfeiture, repurchase and other restrictions on such Awards shall lapse, in which case, such Awards shall be canceled upon the consummation of the Change in Control in exchange for the right to receive the Change in Control consideration payable to other holders of Common Stock (i) which may be on such terms and conditions as apply generally to holders of Common Stock under the Change in Control documents (including, without limitation, any escrow, earn-out or other deferred consideration provisions) or such other terms and conditions as the Administrator may provide, and (ii) determined by reference to the number of shares subject to such Awards and net of any applicable exercise price; provided that to the extent that any Awards constitute "nonqualified deferred compensation" that may not be paid upon the Change in Control under Section 409A without the imposition of taxes thereon under Section 409A, the timing of such payments shall be governed by the applicable Award Agreement (subject to any deferred consideration provisions applicable under the Change in Control documents); and provided, further, that if the amount to which a Participant would be entitled upon the settlement or exercise of such Award at the time of the Change in Control is equal to or less than zero, then such Award may be terminated without payment. The Administrator shall determine whether an Assumption of an Award has occurred in connection with a Change in Control.

8.4 Administrative Stand Still. In the event of any pending stock dividend, stock split, combination or exchange of shares, merger, consolidation or other distribution (other than normal cash dividends) of Company assets to stockholders, or any other extraordinary transaction or change affecting the Shares or the share price of Common Stock, including any Equity Restructuring or any securities offering or other similar transaction, for administrative convenience, the Administrator may refuse to permit the exercise of any Award for up to sixty days before or after such transaction.

8.5 General. Except as expressly provided in the Plan or the Administrator's action under the Plan, no Participant will have any rights due to any subdivision or consolidation of Shares of any class, dividend payment, increase or decrease in the number of Shares of any class or dissolution, liquidation, merger, or consolidation of the Company or other corporation. Except as expressly provided with respect to an Equity Restructuring under Section 8.1 or the Administrator's action under the Plan, no issuance by the Company of Shares of any class, or securities convertible into Shares of any class, will affect, and no adjustment will be made regarding, the number of Shares subject to an Award or the Award's grant or exercise price. The existence of the Plan, any Award Agreements and the Awards granted hereunder will not affect or restrict in any way the Company's right or power to make or authorize (i) any adjustment, recapitalization, reorganization or other change in the Company's capital structure or its business, (ii) any merger, consolidation dissolution or liquidation of the Company or sale of Company assets or (iii) any sale or issuance of securities, including securities with rights superior to those of the Shares or securities convertible into or exchangeable for Shares. The Administrator may treat Participants and Awards (or portions thereof) differently under this Article VIII.

## ARTICLE IX.
## GENERAL PROVISIONS APPLICABLE TO AWARDS

9.1 Transferability. Except as the Administrator may determine or provide in an Award Agreement or otherwise for Awards other than Incentive Stock Options, Awards may not be sold, assigned, transferred, pledged or otherwise encumbered, either voluntarily or by operation of law, except by will or the laws of descent and distribution, or, subject to the Administrator's consent, pursuant to a domestic relations order, and, during the life of the Participant, will be exercisable only by the Participant. References to a Participant, to the extent relevant in the context, will include references to a Participant's authorized transferee that the Administrator specifically approves.

9.2 Documentation. Each Award will be evidenced in an Award Agreement, which may be written or electronic, as the Administrator determines. Each Award may contain terms and conditions in addition to those set forth in the Plan.

9.3 Discretion. Except as the Plan otherwise provides, each Award may be made alone or in addition or in relation to any other Award. The terms of each Award to a Participant need not be identical, and the Administrator need not treat Participants or Awards (or portions thereof) uniformly.

9.4 Termination of Status. The Administrator will determine how the disability, death, retirement, authorized leave of absence or any other change or purported change in a Participant's Service Provider status affects an Award and the extent to which, and the period during which, the Participant, the Participant's legal representative, conservator, guardian or Designated Beneficiary may exercise rights under the Award, if applicable.

9.5 Withholding. Each Participant must pay the Company, or make provision satisfactory to the Administrator for payment of, any taxes required by law to be withheld in connection with such Participant's Awards by the date of the event creating the tax liability. The Company may deduct an amount sufficient to satisfy such tax obligations based on the applicable statutory withholding rates (or such other rate as may be determined by the Company after considering any accounting consequences or costs) from any payment of any kind otherwise due to a Participant. In the absence of a contrary determination by the Company (or, with respect to withholding pursuant to clause (ii) below with respect to Awards held by individuals subject to Section 16 of the Exchange Act, a contrary determination by the Administrator), all tax withholding obligations will be calculated based on the minimum applicable statutory withholding rates. Subject to Section 10.8 and any Company insider trading policy (including blackout periods), Participants may satisfy such tax obligations (i) in cash, by wire transfer of immediately available funds, by check made payable to the order of the Company, provided that the Company may limit the use of the foregoing payment forms if one or more of the payment forms below is permitted, (ii) to the extent permitted by the Administrator, in whole or in part by delivery of Shares, including Shares delivered by attestation and Shares retained from the Award creating the tax obligation, valued at their Fair Market Value on the date of delivery, (iii) if there is a public market for Shares at the time the tax obligations are satisfied, unless the Company otherwise determines, (A) delivery (including electronically or telephonically to the extent permitted by the Company) of an irrevocable and unconditional undertaking by a broker acceptable to the Company to deliver promptly to the Company sufficient funds to satisfy the tax obligations, or (B) delivery by the Participant to the Company of a copy of irrevocable and unconditional instructions to a broker acceptable to the Company to deliver promptly to the Company cash or a check sufficient to satisfy the tax withholding; provided that such amount is paid to the Company at such time as may be required by the Administrator, or (iv) to the extent permitted by the Company, any combination of the foregoing payment forms approved by the Administrator. Notwithstanding any other provision of the Plan, the number of Shares which may be so delivered or retained pursuant to clause (ii) of the immediately preceding sentence shall be limited to the number of Shares which have a Fair Market Value on the date of delivery or retention no greater than the aggregate amount of such liabilities based on the maximum individual statutory tax rate in the applicable jurisdiction at the time of such withholding (or such other rate as may be required to avoid the liability classification of the applicable award under generally accepted accounting principles in the United States of America)); provided, however, to the extent such Shares were acquired by Participant from the Company as compensation, the Shares must have been held for the minimum period required by applicable accounting rules to avoid a charge to the Company's earnings for financial reporting purposes; provided, further, that, any such Shares delivered or retained shall be rounded up to the nearest whole Share to the extent rounding up to the nearest whole Share does not result in the liability classification of the applicable Award under generally accepted accounting principles in the United States of America. If any tax withholding obligation will be satisfied under clause (ii) above by the Company's retention of Shares from the Award creating the tax obligation and there is a public market for Shares at the time the tax

obligation is satisfied, the Company may elect to instruct any brokerage firm determined acceptable to the Company for such purpose to sell on the applicable Participant's behalf some or all of the Shares retained and to remit the proceeds of the sale to the Company or its designee, and each Participant's acceptance of an Award under the Plan will constitute the Participant's authorization to the Company and instruction and authorization to such brokerage firm to complete the transactions described in this sentence.

9.6 Amendment of Award; Repricing. The Administrator may amend, modify or terminate any outstanding Award, including by substituting another Award of the same or a different type, changing the exercise or settlement date, and converting an Incentive Stock Option to a Non-Qualified Stock Option. The Participant's consent to such action will be required unless (i) the action, taking into account any related action, does not materially and adversely affect the Participant's rights under the Award, or (ii) the change is permitted under Article VIII or pursuant to Section 10.6. Notwithstanding the foregoing or anything in the Plan to the contrary, the Administrator may, without the approval of the stockholders of the Company, reduce the exercise price per share of outstanding Options or Stock Appreciation Rights or cancel outstanding Options or Stock Appreciation Rights in exchange for cash, other Awards or Options or Stock Appreciation Rights with an exercise price per share that is less than the exercise price per share of the original Options or Stock Appreciation Rights.

9.7 Conditions on Delivery of Stock. The Company will not be obligated to deliver any Shares under the Plan or remove restrictions from Shares previously delivered under the Plan until (i) all Award conditions have been met or removed to the Company's satisfaction, (ii) as determined by the Company, all other legal matters regarding the issuance and delivery of such Shares have been satisfied, including any applicable securities laws and stock exchange or stock market rules and regulations, and (iii) the Participant has executed and delivered to the Company such representations or agreements as the Administrator deems necessary or appropriate to satisfy any Applicable Laws. The Company's inability to obtain authority from any regulatory body having jurisdiction, which the Administrator determines is necessary to the lawful issuance and sale of any securities, will relieve the Company of any liability for failing to issue or sell such Shares as to which such requisite authority has not been obtained.

9.8 Acceleration. The Administrator may at any time provide that any Award will become immediately vested and fully or partially exercisable, free of some or all restrictions or conditions, or otherwise fully or partially realizable.

9.9 Additional Terms of Incentive Stock Options. The Administrator may grant Incentive Stock Options only to employees of the Company, any of its present or future parent or subsidiary corporations, as defined in Sections 424(e) or (f) of the Code, respectively, and any other entities the employees of which are eligible to receive Incentive Stock Options under the Code. If an Incentive Stock Option is granted to a Greater Than 10% Stockholder, the exercise price will not be less than 110% of the Fair Market Value on the Option's grant date, and the term of the Option will not exceed five years. All Incentive Stock Options will be subject to and construed consistently with Section 422 of the Code. By accepting an Incentive Stock Option, the Participant agrees to give prompt notice to the Company of dispositions or other transfers (other than in connection with a Change in Control) of Shares acquired under the Option made within (i) two years from the grant date of the Option or (ii) one year after the transfer of such Shares to the Participant, specifying the date of the disposition or other transfer and the amount the Participant realized, in cash, other property, assumption of indebtedness or other consideration, in such disposition or other transfer. Neither the Company nor the Administrator will be liable to a Participant, or any other party, if an Incentive Stock Option fails or ceases to qualify as an "incentive stock option" under Section 422 of the Code. Any Incentive Stock Option or portion thereof that fails to qualify as an "incentive stock option" under Section 422 of the Code for any reason, including becoming exercisable with respect to Shares having a fair market value exceeding the $100,000 limitation under Treasury Regulation Section 1.422-4, will be a Non-Qualified Stock Option.

## ARTICLE X.
## MISCELLANEOUS

10.1 No Right to Employment or Other Status. No person will have any claim or right to be granted an Award, and the grant of an Award will not be construed as giving a Participant the right to continued employment or any other relationship with the Company. The Company expressly reserves the right at any time to dismiss or otherwise terminate its relationship with a Participant free from any liability or claim under the Plan or any Award, except as expressly provided in an Award Agreement.

10.2 No Rights as Stockholder; Certificates. Subject to the Award Agreement, no Participant or Designated Beneficiary will have any rights as a stockholder with respect to any Shares to be distributed under an Award until becoming the record holder of such Shares. Notwithstanding any other provision of the Plan, unless the Administrator otherwise determines or Applicable Laws require, the Company will not be required to deliver to any Participant certificates evidencing Shares issued in connection with any Award and instead such Shares may be recorded in the books of the Company (or, as applicable, its transfer agent or stock plan administrator). The Company may place legends on stock certificates issued under the Plan that the Administrator deems necessary or appropriate to comply with Applicable Laws.

10.3 Effective Date and Term of Plan. Unless earlier terminated by the Board, the Plan will become effective on the day prior to the Public Trading Date and will remain in effect until the tenth anniversary of the earlier of (i) the date the Board adopted the Plan or (ii) the date the Company's stockholders approved the Plan, but Awards previously granted may extend beyond that date in accordance with the Plan. If the Plan is not approved by the Company's stockholders, the Plan will not become effective, no Awards will be granted under the Plan and the Prior Plan will continue in full force and effect in accordance with its terms. The Plan will be submitted for the approval of the Company's stockholders within twelve (12) months after the date of the Board's adoption of the Plan.

10.4 Amendment of Plan. The Administrator may amend, suspend or terminate the Plan at any time; provided that no amendment, other than an increase to the Overall Share Limit, may materially and adversely affect any Award outstanding at the time of such amendment without the affected Participant's consent. No Awards may be granted under the Plan during any suspension period or after the Plan's termination. Awards outstanding at the time of any Plan suspension or termination will continue to be governed by the Plan and the Award Agreement, as in effect before such suspension or termination. The Board will obtain stockholder approval of any Plan amendment to the extent necessary to comply with Applicable Laws.

10.5 Provisions for Foreign Participants. The Administrator may modify Awards granted to Participants who are foreign nationals or employed outside the United States or establish subplans or procedures under the Plan to address differences in laws, rules, regulations or customs of such foreign jurisdictions with respect to tax, securities, currency, employee benefit or other matters.

10.6 Section 409A.

(a) General. The Company intends that all Awards be structured to comply with, or be exempt from, Section 409A, such that no adverse tax consequences, interest, or penalties under Section 409A apply. Notwithstanding anything in the Plan or any Award Agreement to the contrary, the Administrator may, without a Participant's consent, amend this Plan or Awards, adopt policies and procedures, or take any other actions (including amendments, policies, procedures and retroactive actions) as are necessary or appropriate to preserve the intended tax treatment of Awards, including any such actions intended to (A) exempt this Plan or any Award from Section 409A, or (B) comply with Section 409A, including regulations, guidance, compliance programs and other interpretative authority that may be issued

after an Award's grant date. The Company makes no representations or warranties as to an Award's tax treatment under Section 409A or otherwise. The Company will have no obligation under this Section 10.6 or otherwise to avoid the taxes, penalties or interest under Section 409A with respect to any Award and will have no liability to any Participant or any other person if any Award, compensation or other benefits under the Plan are determined to constitute noncompliant "nonqualified deferred compensation" subject to taxes, penalties or interest under Section 409A.

(b) Separation from Service. If an Award constitutes "nonqualified deferred compensation" under Section 409A, any payment or settlement of such Award upon a termination of a Participant's Service Provider relationship will, to the extent necessary to avoid taxes under Section 409A, be made only upon the Participant's "separation from service" (within the meaning of Section 409A), whether such "separation from service" occurs upon or after the termination of the Participant's Service Provider relationship. For purposes of this Plan or any Award Agreement relating to any such payments or benefits, references to a "termination," "termination of employment" or like terms means a "separation from service."

(c) Payments to Specified Employees. Notwithstanding any contrary provision in the Plan or any Award Agreement, any payment(s) of "nonqualified deferred compensation" required to be made under an Award to a "specified employee" (as defined under Section 409A and as the Administrator determines) due to his or her "separation from service" will, to the extent necessary to avoid taxes under Section 409A(a)(2)(B)(i) of the Code, be delayed for the six-month period immediately following such "separation from service" (or, if earlier, until the specified employee's death) and will instead be paid (as set forth in the Award Agreement) on the day immediately following such six-month period or as soon as administratively practicable thereafter (without interest). Any payments of "nonqualified deferred compensation" under such Award payable more than six months following the Participant's "separation from service" will be paid at the time or times the payments are otherwise scheduled to be made.

10.7 Limitations on Liability. Notwithstanding any other provisions of the Plan, no individual acting as a director, officer, other employee or agent of the Company or any Subsidiary will be liable to any Participant, former Participant, spouse, beneficiary, or any other person for any claim, loss, liability, or expense incurred in connection with the Plan or any Award, and such individual will not be personally liable with respect to the Plan because of any contract or other instrument executed in his or her capacity as an Administrator, director, officer, other employee or agent of the Company or any Subsidiary. The Company will indemnify and hold harmless each director, officer, other employee and agent of the Company or any Subsidiary that has been or will be granted or delegated any duty or power relating to the Plan's administration or interpretation, against any cost or expense (including attorneys' fees) or liability (including any sum paid in settlement of a claim with the Administrator's approval) arising from any act or omission concerning this Plan unless arising from such person's own fraud or bad faith.

10.8 Lock-Up Period. The Company may, at the request of any underwriter representative or otherwise, in connection with registering the offering of any Company securities under the Securities Act, prohibit Participants from, directly or indirectly, selling or otherwise transferring any Shares or other Company securities during a period of up to one hundred eighty days following the effective date of a Company registration statement filed under the Securities Act, or such longer period as determined by the underwriter.

10.9 Data Privacy. As a condition for receiving any Award, each Participant explicitly and unambiguously consents to the collection, use and transfer, in electronic or other form, of personal data as described in this section by and among the Company and its Subsidiaries and affiliates exclusively for implementing, administering and managing the Participant's participation in the Plan. The Company and its Subsidiaries and affiliates may hold certain personal information about a Participant, including the

Participant's name, address and telephone number; birthdate; social security, insurance number or other identification number; salary; nationality; job title(s); any Shares held in the Company or its Subsidiaries and affiliates; and Award details, to implement, manage and administer the Plan and Awards (the "***Data***"). The Company and its Subsidiaries and affiliates may transfer the Data amongst themselves as necessary to implement, administer and manage a Participant's participation in the Plan, and the Company and its Subsidiaries and affiliates may transfer the Data to third parties assisting the Company with Plan implementation, administration and management. These recipients may be located in the Participant's country, or elsewhere, and the Participant's country may have different data privacy laws and protections than the recipients' country. By accepting an Award, each Participant authorizes such recipients to receive, possess, use, retain and transfer the Data, in electronic or other form, to implement, administer and manage the Participant's participation in the Plan, including any required Data transfer to a broker or other third party with whom the Company or the Participant may elect to deposit any Shares. The Data related to a Participant will be held only as long as necessary to implement, administer, and manage the Participant's participation in the Plan. A Participant may, at any time, view the Data that the Company holds regarding such Participant, request additional information about the storage and processing of the Data regarding such Participant, recommend any necessary corrections to the Data regarding the Participant or refuse or withdraw the consents in this Section 10.9 in writing, without cost, by contacting the local human resources representative. The Company may cancel Participant's ability to participate in the Plan and, in the Administrator's discretion, the Participant may forfeit any outstanding Awards if the Participant refuses or withdraws the consents in this Section 10.9. For more information on the consequences of refusing or withdrawing consent, Participants may contact their local human resources representative.

10.10 Severability. If any portion of the Plan or any action taken under it is held illegal or invalid for any reason, the illegality or invalidity will not affect the remaining parts of the Plan, and the Plan will be construed and enforced as if the illegal or invalid provisions had been excluded, and the illegal or invalid action will be null and void.

10.11 Governing Documents. If any contradiction occurs between the Plan and any Award Agreement or other written agreement between a Participant and the Company (or any Subsidiary) that the Administrator has approved, the Plan will govern, unless it is expressly specified in such Award Agreement or other written document that a specific provision of the Plan will not apply.

10.12 Governing Law. The Plan and all Awards will be governed by and interpreted in accordance with the laws of the State of Delaware, disregarding any state's choice-of-law principles requiring the application of a jurisdiction's laws other than the State of Delaware.

10.13 Claw-back Provisions. All Awards (including, without limitation, any proceeds, gains or other economic benefit actually or constructively received by Participant upon any receipt or exercise of any Award or upon the receipt or resale of any shares of Common Stock underlying the Award) shall be subject to the provisions of any claw-back policy implemented by the Company, including, without limitation, any claw-back policy adopted to comply with Applicable Laws (including the Dodd-Frank Wall Street Reform and Consumer Protection Act and any rules or regulations promulgated thereunder) as and to the extent set forth in such claw-back policy or the Award Agreement.

10.14 Titles and Headings. The titles and headings in the Plan are for convenience of reference only and, if any conflict, the Plan's text, rather than such titles or headings, will control.

10.15 Conformity to Securities Laws. Participant acknowledges that the Plan is intended to conform to the extent necessary with Applicable Laws. Notwithstanding anything herein to the contrary, the Plan and all Awards will be administered only in conformance with Applicable Laws. To the extent

Applicable Laws permit, the Plan and all Award Agreements will be deemed amended as necessary to conform to Applicable Laws.

10.16 Relationship to Other Benefits. No payment under the Plan will be taken into account in determining any benefits under any pension, retirement, savings, profit sharing, group insurance, welfare or other benefit plan of the Company or any Subsidiary except as expressly provided in writing in such other plan or an agreement thereunder.

10.17 Broker-Assisted Sales. In the event of a broker-assisted sale of Shares in connection with the payment of amounts owed by a Participant under or with respect to the Plan or Awards, including amounts to be paid under the final sentence of Section 9.5: (a) any Shares to be sold through the broker-assisted sale will be sold on the day the payment first becomes due, or as soon thereafter as practicable; (b) such Shares may be sold as part of a block trade with other Participants in the Plan in which all participants receive an average price; (c) the applicable Participant will be responsible for all broker's fees and other costs of sale, and by accepting an Award, each Participant agrees to indemnify and hold the Company harmless from any losses, costs, damages, or expenses relating to any such sale; (d) to the extent the Company or its designee receives proceeds of such sale that exceed the amount owed, the Company will pay such excess in cash to the applicable Participant as soon as reasonably practicable; (e) the Company and its designees are under no obligation to arrange for such sale at any particular price; and (f) in the event the proceeds of such sale are insufficient to satisfy the Participant's applicable obligation, the Participant may be required to pay immediately upon demand to the Company or its designee an amount in cash sufficient to satisfy any remaining portion of the Participant's obligation.

## ARTICLE XI.
## DEFINITIONS

As used in the Plan, the following words and phrases will have the following meanings:

11.1 "***Administrator***" means the Board or a Committee to the extent that the Board's powers or authority under the Plan have been delegated to such Committee.

11.2 "***Applicable Laws***" means the requirements relating to the administration of equity incentive plans under U.S. federal and state securities, tax and other applicable laws, rules and regulations, the applicable rules of any stock exchange or quotation system on which the Common Stock is listed or quoted and the applicable laws and rules of any foreign country or other jurisdiction where Awards are granted.

11.3 "***Award***" means, individually or collectively, a grant under the Plan of Options, Stock Appreciation Rights, Restricted Stock, Restricted Stock Units or Other Stock or Cash Based Awards.

11.4 "***Award Agreement***" means a written agreement evidencing an Award, which may be electronic, that contains such terms and conditions as the Administrator determines, consistent with and subject to the terms and conditions of the Plan.

11.5 "***Board***" means the Board of Directors of the Company.

11.6 "***Cause***" with respect to a Participant, means "Cause" (or any term of similar effect) as defined in such Participant's employment agreement with the Company if such an agreement exists and contains a definition of Cause (or term of similar effect), or, if no such agreement exists or such agreement does not contain a definition of Cause (or term of similar effect), then Cause shall include, but not be limited to: (i) the Participant's unauthorized use or disclosure of confidential information or trade secrets of the

Company or any material breach of a written agreement between the Participant and the Company, including without limitation a material breach of any employment, confidentiality, non-compete, non-solicit or similar agreement; (ii) the Participant's commission of, indictment for or the entry of a plea of guilty or *nolo contendere* by the Participant to, a felony under the laws of the United States or any state thereof or any crime involving dishonesty or moral turpitude (or any similar crime in any jurisdiction outside the United States); (iii) the Participant's gross negligence or willful misconduct or the Participant's willful or repeated failure or refusal to substantially perform assigned duties; (iv) any act of fraud, embezzlement, material misappropriation or dishonesty committed by the Participant against the Company; or (v) any acts, omissions or statements by a Participant which the Company reasonably determines to be materially detrimental or damaging to the reputation, operations, prospects or business relations of the Company.

11.7 "***Change in Control***" means and includes each of the following:

(a) A transaction or series of transactions (other than an offering of Common Stock to the general public through a registration statement filed with the Securities and Exchange Commission or a transaction or series of transactions that meets the requirements of clauses (i) and (ii) of subsection (c) below) whereby any "person" or related "group" of "persons" (as such terms are used in Sections 13(d) and 14(d)(2) of the Exchange Act) (other than the Company, any of its Subsidiaries, an employee benefit plan maintained by the Company or any of its Subsidiaries or a "person" that, prior to such transaction, directly or indirectly controls, is controlled by, or is under common control with, the Company) directly or indirectly acquires beneficial ownership (within the meaning of Rule 13d-3 under the Exchange Act) of securities of the Company possessing more than 50% of the total combined voting power of the Company's securities outstanding immediately after such acquisition; or

(b) During any period of two consecutive years, individuals who, at the beginning of such period, constitute the Board together with any new Director(s) (other than a Director designated by a person who shall have entered into an agreement with the Company to effect a transaction described in subsections (a) or (c)) whose election by the Board or nomination for election by the Company's stockholders was approved by a vote of at least two-thirds of the Directors then still in office who either were Directors at the beginning of the two-year period or whose election or nomination for election was previously so approved, cease for any reason to constitute a majority thereof; or

(c) The consummation by the Company (whether directly involving the Company or indirectly involving the Company through one or more intermediaries) of (x) a merger, consolidation, reorganization, or business combination or (y) a sale or other disposition of all or substantially all of the Company's assets in any single transaction or series of related transactions or (z) the acquisition of assets or stock of another entity, in each case other than a transaction:

(i) which results in the Company's voting securities outstanding immediately before the transaction continuing to represent (either by remaining outstanding or by being converted into voting securities of the Company or the person that, as a result of the transaction, controls, directly or indirectly, the Company or owns, directly or indirectly, all or substantially all of the Company's assets or otherwise succeeds to the business of the Company (the Company or such person, the "***Successor Entity***")) directly or indirectly, at least a majority of the combined voting power of the Successor Entity's outstanding voting securities immediately after the transaction, and

(ii) after which no person or group beneficially owns voting securities representing 50% or more of the combined voting power of the Successor Entity; provided, however, that no person or group shall be treated for purposes of this clause (ii) as beneficially owning 50% or more of the combined voting power of the Successor Entity solely as a result of the voting power held in the Company prior to the consummation of the transaction.

Notwithstanding the foregoing, if a Change in Control constitutes a payment event with respect to any Award (or portion of any Award) that provides for the deferral of compensation that is subject to Section 409A, to the extent required to avoid the imposition of additional taxes under Section 409A, the transaction or event described in subsection (a), (b) or (c) with respect to such Award (or portion thereof) shall only constitute a Change in Control for purposes of the payment timing of such Award if such transaction also constitutes a "change in control event," as defined in Treasury Regulation Section 1.409A-3(i)(5).

The Administrator shall have full and final authority, which shall be exercised in its discretion, to determine conclusively whether a Change in Control has occurred pursuant to the above definition, the date of the occurrence of such Change in Control and any incidental matters relating thereto; provided that any exercise of authority in conjunction with a determination of whether a Change in Control is a "change in control event" as defined in Treasury Regulation Section 1.409A-3(i)(5) shall be consistent with such regulation.

11.8 "***Code***" means the Internal Revenue Code of 1986, as amended, and the regulations issued thereunder.

11.9 "***Committee***" means one or more committees or subcommittees of the Board, which may include one or more Company directors or executive officers, to the extent Applicable Laws permit. To the extent required to comply with the provisions of Rule 16b-3, it is intended that each member of the Committee will be, at the time the Committee takes any action with respect to an Award that is subject to Rule 16b-3, a "non-employee director" within the meaning of Rule 16b-3; however, a Committee member's failure to qualify as a "non-employee director" within the meaning of Rule 16b-3 will not invalidate any Award granted by the Committee that is otherwise validly granted under the Plan.

11.10 "***Common Stock***" means the common stock of the Company.

11.11 "***Company***" means Phathom Pharmaceuticals, Inc., a Delaware corporation, or any successor.

11.12 "***Consultant***" means any person, including any adviser, engaged by the Company or its parent or Subsidiary to render services to such entity if the consultant or adviser: (a) renders bona fide services to the Company; (b) renders services not in connection with the offer or sale of securities in a capital-raising transaction and does not directly or indirectly promote or maintain a market for the Company's securities; and (c) is a natural person.

11.13 "***Designated Beneficiary***" means the beneficiary or beneficiaries the Participant designates, in a manner the Administrator determines, to receive amounts due or exercise the Participant's rights if the Participant dies or becomes incapacitated. Without a Participant's effective designation, "Designated Beneficiary" will mean the Participant's estate.

11.14 "***Director***" means a Board member.

11.15 "***Disability***" means a permanent and total disability under Section 22(e)(3) of the Code, as amended.

11.16 "***Dividend Equivalents***" means a right granted to a Participant under the Plan to receive the equivalent value (in cash or Shares) of dividends paid on Shares.

11.17 "***Employee***" means any employee of the Company or its Subsidiaries.

11.18 "***Equity Restructuring***" means, as determined by the Administrator, a non-reciprocal transaction between the Company and its stockholders, such as a stock dividend, stock split, spin-off or recapitalization through a large, nonrecurring cash dividend, that affects the number or kind of shares of Common Stock (or other securities of the Company) or the share price of Common Stock (or other securities of the Company) and causes a change in the per share value of the Common Stock underlying outstanding Awards.

11.19 "***Exchange Act***" means the Securities Exchange Act of 1934, as amended.

11.20 "***Fair Market Value***" means, as of any date, the value of a share of Common Stock determined as follows: (a) if the Common Stock is listed on any established stock exchange, its Fair Market Value will be the closing sales price for such Common Stock as quoted on such exchange for such date, or if no sale occurred on such date, the last day preceding such date during which a sale occurred, as reported in *The Wall Street Journal* or another source the Administrator deems reliable; (b) if the Common Stock is not traded on a stock exchange but is quoted on a national market or other quotation system, the closing sales price on such date, or if no sales occurred on such date, then on the last date preceding such date during which a sale occurred, as reported in *The Wall Street Journal* or another source the Administrator deems reliable; or (c) without an established market for the Common Stock, the Administrator will determine the Fair Market Value in its discretion. Notwithstanding the foregoing, with respect to any Award granted on the pricing date of the Company's initial public offering, the Fair Market Value shall mean the initial public offering price of a Share as set forth in the Company's final prospectus relating to its initial public offering filed with the Securities and Exchange Commission.

11.21 "***Good Reason***" means (a) if a Participant is a party to a written employment or consulting agreement with the Company or any of its Subsidiaries or an Award Agreement in which the term "good reason" is defined, "Good Reason" as defined in such agreement, and (b) if no such agreement exists, (i) a change in the Participant's position with the Company (or its Subsidiary employing the Participant) that materially reduces the Participant's authority, duties or responsibilities or the level of management to which he or she reports, (ii) a material diminution in the Participant's level of compensation (including base salary, fringe benefits and target bonuses under any corporate performance-based incentive programs) or (iii) a relocation of the Participant's place of employment by more than 50 miles, provided that such change, reduction or relocation is effected by the Company (or its Subsidiary employing the Participant) without the Participant's consent.

11.22 "***Greater Than 10% Stockholder***" means an individual then owning (within the meaning of Section 424(d) of the Code) more than 10% of the total combined voting power of all classes of stock of the Company or its parent or subsidiary corporation, as defined in Section 424(e) and (f) of the Code, respectively.

11.23 "***Incentive Stock Option***" means an Option intended to qualify as an "incentive stock option" as defined in Section 422 of the Code.

11.24 "***Non-Qualified Stock Option***" means an Option not intended or not qualifying as an Incentive Stock Option.

11.25 "***Option***" means an option to purchase Shares, which will either be an Incentive Stock option or a Non-Qualified Stock Option.

11.26 "***Other Stock or Cash Based Awards***" means cash awards, awards of Shares, and other awards valued wholly or partially by referring to, or are otherwise based on, Shares or other property awarded to a Participant under Article VII.

11.27 "***Overall Share Limit***" means the sum of (a) 2,700,000 Shares; (b) any shares of Common Stock which are subject to Prior Plan Awards which become available for issuance under the Plan pursuant to Article IV (which number added to the Overall Share Limit pursuant to clause (b) shall not exceed 1,416,788 shares of Common Stock); and (c) an annual increase on the first day of each calendar year beginning January 1, 2020 and ending on and including January 1, 2029, equal to the lesser of (i) 5% of the aggregate number of shares of Common Stock outstanding on the final day of the immediately preceding calendar year and (ii) such smaller number of Shares as is determined by the Board.

11.28 "***Participant***" means a Service Provider who has been granted an Award.

11.29 "***Performance Criteria***" mean the criteria (and adjustments) that the Administrator may select for an Award to establish performance goals for a performance period, which may include the following: net earnings or losses (either before or after one or more of interest, taxes, depreciation, amortization, and non-cash equity-based compensation expense); gross or net sales or revenue or sales or revenue growth; net income (either before or after taxes) or adjusted net income; profits (including but not limited to gross profits, net profits, profit growth, net operation profit or economic profit), profit return ratios or operating margin; budget or operating earnings (either before or after taxes or before or after allocation of corporate overhead and bonus); cash flow (including operating cash flow and free cash flow or cash flow return on capital); return on assets; return on capital or invested capital; cost of capital; return on stockholders' equity; total stockholder return; return on sales; costs, reductions in costs and cost control measures; expenses; working capital; earnings or loss per share; adjusted earnings or loss per share; price per share or dividends per share (or appreciation in or maintenance of such price or dividends); regulatory achievements or compliance; implementation, completion or attainment of objectives relating to research, development, regulatory, commercial, or strategic milestones or developments; market share; economic value or economic value added models; division, group or corporate financial goals; customer satisfaction/growth; customer service; employee satisfaction; recruitment and maintenance of personnel; human resources management; supervision of litigation and other legal matters; strategic partnerships and transactions; financial ratios (including those measuring liquidity, activity, profitability or leverage); debt levels or reductions; sales-related goals; financing and other capital raising transactions; cash on hand; acquisition activity; investment sourcing activity; and marketing initiatives, any of which may be measured in absolute terms or as compared to any incremental increase or decrease. Such performance goals also may be based solely by reference to the Company's performance or the performance of a Subsidiary, division, business segment or business unit of the Company or a Subsidiary, or based upon performance relative to performance of other companies or upon comparisons of any of the indicators of performance relative to performance of other companies.

11.30 "***Plan***" means this 2019 Incentive Award Plan.

11.31 "***Prior Plan***" means the Phathom Pharmaceuticals, Inc. 2019 Equity Incentive Plan.

11.32 "***Prior Plan Award***" means an award outstanding under the Prior Plan as of the Plan's effective date under Section 10.3.

11.33 "***Public Trading Date***" means the first date upon which the Common Stock is listed (or approved for listing) upon notice of issuance on any securities exchange or designated (or approved for designation) upon notice of issuance as a national market security on an interdealer quotation system, or, if earlier, the date on which the Company becomes a "publicly held corporation" for purposes of Treasury Regulation Section 1.162-27(c)(1).

11.34 "***Restricted Stock***" means Shares awarded to a Participant under Article VI subject to certain vesting conditions and other restrictions.

11.35 "***Restricted Stock Unit***" means an unfunded, unsecured right to receive, on the applicable settlement date, one Share or an amount in cash or other consideration determined by the Administrator to be of equal value as of such settlement date awarded to a Participant under Article VI subject to certain vesting conditions and other restrictions.

11.36 "***Rule 16b-3***" means Rule 16b-3 promulgated under the Exchange Act.

11.37 "***Section 409A***" means Section 409A of the Code and all regulations, guidance, compliance programs and other interpretative authority thereunder.

11.38 "***Securities Act***" means the Securities Act of 1933, as amended.

11.39 "***Service Provider***" means an Employee, Consultant or Director.

11.40 "***Shares***" means shares of Common Stock.

11.41 "***Stock Appreciation Right***" means a stock appreciation right granted under Article V.

11.42 "***Subsidiary***" means any entity (other than the Company), whether domestic or foreign, in an unbroken chain of entities beginning with the Company if each of the entities other than the last entity in the unbroken chain beneficially owns, at the time of the determination, securities or interests representing at least 50% of the total combined voting power of all classes of securities or interests in one of the other entities in such chain.

11.43 "***Substitute Awards***" shall mean Awards granted or Shares issued by the Company in assumption of, or in substitution or exchange for, awards previously granted, or the right or obligation to make future awards, in each case by a company acquired by the Company or any Subsidiary or with which the Company or any Subsidiary combines.

11.44 "***Termination of Service***" means the date the Participant ceases to be a Service Provider.

*** * * * ***

**PHATHOM PHARMACEUTICALS, INC.**

**2019 INCENTIVE AWARD PLAN**

## STOCK OPTION GRANT NOTICE

Capitalized terms not specifically defined in this Stock Option Grant Notice (the "***Grant Notice***") have the meanings given to them in the 2019 Incentive Award Plan (as amended from time to time, the "***Plan***") of Phathom Pharmaceuticals, Inc. (the "***Company***").

The Company hereby grants to the participant listed below ("***Participant***") the stock option described in this Grant Notice (the "***Option***"), subject to the terms and conditions of the Plan and the Stock Option Agreement attached hereto as **Exhibit A** (the "***Agreement***"), both of which are incorporated into this Grant Notice by reference.

**Participant:**

**Grant Date:**

**Exercise Price per Share:**

**Shares Subject to the Option:**

**Final Expiration Date:**

**Vesting Commencement Date:**

**Vesting Schedule:** [To be specified in individual award agreements]

**Type of Option** ☐ Incentive Stock Option ☐ Non-Qualified Stock Option

By Participant's signature below, Participant agrees to be bound by the terms of this Grant Notice, the Plan and the Agreement. Participant has reviewed the Plan, this Grant Notice and the Agreement in their entirety, has had an opportunity to obtain the advice of counsel prior to executing this Grant Notice and fully understands all provisions of the Plan, this Grant Notice and the Agreement. Participant hereby agrees to accept as binding, conclusive and final all decisions or interpretations of the Administrator upon any questions arising under the Plan, this Grant Notice or the Agreement.

| **PHATHOM PHARMACEUTICALS, INC.** | | **PARTICIPANT** | |
|---|---|---|---|
| By: | _____ | By: | _____ |
| Print Name: | _____ | Print Name: | _____ |
| Title: | _____ | | |

## STOCK OPTION AGREEMENT

Capitalized terms not specifically defined in this Agreement have the meanings specified in the Grant Notice or, if not defined in the Grant Notice, in the Plan.

### ARTICLE XII.
### GENERAL

12.1 Grant of Option. The Company has granted to Participant the Option effective as of the grant date set forth in the Grant Notice (the "***Grant Date***").

12.2 Incorporation of Terms of Plan. The Option is subject to the terms and conditions set forth in this Agreement and the Plan, which is incorporated herein by reference. In the event of any inconsistency between the Plan and this Agreement, the terms of the Plan will control.

### ARTICLE XIII.
### PERIOD OF EXERCISABILITY

13.1 Commencement of Exercisability. The Option will vest and become exercisable according to the vesting schedule in the Grant Notice (the "***Vesting Schedule***"), except that any fraction of a Share as to which the Option would be vested or exercisable will be accumulated and will vest and become exercisable only when a whole Share has accumulated. The Option shall not be exercisable with respect to fractional Shares. Notwithstanding anything in the Grant Notice, the Plan or this Agreement to the contrary, unless the Administrator otherwise determines, the Option will immediately expire and be forfeited as to any portion that is not vested and exercisable as of Participant's Termination of Service for any reason.

13.2 Duration of Exercisability. The Vesting Schedule is cumulative. Any portion of the Option which vests and becomes exercisable will remain vested and exercisable until the Option expires. The Option will be forfeited immediately upon its expiration.

13.3 Expiration of Option. Subject to Section 5.3 of the Plan, the Option may not be exercised to any extent by anyone after, and will expire on, the first of the following to occur:

(a) The final expiration date in the Grant Notice; which shall in no event be more than ten (10) years from the Grant Date;

(b) If this Option is designated as an Incentive Stock Option and the Participant, at the time the Option was granted, was a Greater Than 10% Stockholder, the expiration of five (5) years from the Grant Date;

(c) Except as the Administrator may otherwise approve, the expiration of three (3) months from the date of Participant's Termination of Service, unless Participant's Termination of Service is for Cause or by reason of Participant's death or Disability;

(d) Except as the Administrator may otherwise approve, the expiration of one (1) year from the date of Participant's Termination of Service by reason of Participant's death or Disability; and

(e) Except as the Administrator may otherwise approve, the date of Participant's Termination of Service for Cause.

**ARTICLE XIV.**
**EXERCISE OF OPTION**

14.1 Person Eligible to Exercise. During Participant's lifetime, only Participant may exercise the Option, unless it has been disposed of, with the consent of the Administrator, pursuant to a domestic relations order. After Participant's death, any exercisable portion of the Option may, prior to the time when the Option becomes unexercisable under Section 2.3 hereof, be exercised by the Participant's Designated Beneficiary or by any person empowered to do so under the deceased Participant's will or under the then applicable laws of descent and distribution.

14.2 Partial Exercise. Any exercisable portion of the Option or the entire Option, if then wholly exercisable, may be exercised, in whole or in part, according to the procedures in the Plan at any time prior to the time the Option or portion thereof expires, except that the Option may only be exercised for whole Shares.

14.3 Tax Withholding.

(a) The Company has the right and option, but not the obligation, to treat Participant's failure to provide timely payment in accordance with the Plan of any withholding tax arising in connection with the Option as Participant's election to satisfy all or any portion of the withholding tax by requesting the Company retain Shares otherwise issuable under the Option.

(b) Participant acknowledges that Participant is ultimately liable and responsible for all taxes owed in connection with the Option, regardless of any action the Company or any Subsidiary takes with respect to any tax withholding obligations that arise in connection with the Option. Neither the Company nor any Subsidiary makes any representation or undertaking regarding the treatment of any tax withholding in connection with the awarding, vesting or exercise of the Option or the subsequent sale of Shares. The Company and the Subsidiaries do not commit and are under no obligation to structure the Option to reduce or eliminate Participant's tax liability.

**ARTICLE XV.**
**OTHER PROVISIONS**

15.1 Adjustments. Participant acknowledges that the Option is subject to adjustment, modification and termination in certain events as provided in this Agreement and the Plan.

15.2 Notices. Any notice to be given under the terms of this Agreement to the Company must be in writing and addressed to the Company in care of the Company's Secretary at the Company's principal office or the Secretary's then-current email address or facsimile number. Any notice to be given under the terms of this Agreement to Participant must be in writing and addressed to Participant (or, if Participant is then deceased, to the person entitled to exercise the Option) at Participant's last known mailing address, email address or facsimile number in the Company's personnel files. By a notice given pursuant to this Section, either party may designate a different address for notices to be given to that party. Any notice will be deemed duly given when actually received, when sent by email, when sent by certified mail (return receipt requested) and deposited with postage prepaid in a post office or branch post office regularly maintained by the United States Postal Service, when delivered by a nationally recognized express shipping company or upon receipt of a facsimile transmission confirmation.

15.3 Titles. Titles are provided herein for convenience only and are not to serve as a basis for interpretation or construction of this Agreement.

15.4 Conformity to Securities Laws. The Participant acknowledges that the Plan, the Grant Notice and this Agreement are intended to conform to the extent necessary with all Applicable Laws and, to the extent Applicable Laws permit, will be deemed amended to the extent necessary to conform to such Applicable Laws.

15.5 Successors and Assigns. The Company may assign any of its rights under this Agreement to single or multiple assignees, and this Agreement shall inure to the benefit of the successors and assigns of the Company. Subject to the restrictions on transfer herein set forth in the Plan, this Agreement shall be binding upon and inure to the benefit of the heirs, legatees, legal representatives, successors and assigns of the parties hereto.

15.6 Limitations Applicable to Section 16 Persons. Notwithstanding any other provision of the Plan or this Agreement, if Participant is subject to Section 16 of the Exchange Act, the Plan, the Grant Notice, this Agreement and the Option will be subject to any additional limitations set forth in any applicable exemptive rule under Section 16 of the Exchange Act (including any amendment to Rule 16b-3) that are requirements for the application of such exemptive rule. To the extent Applicable Laws permit, this Agreement will be deemed amended as necessary to conform to such applicable exemptive rule.

15.7 Entire Agreement. The Plan, the Grant Notice and this Agreement constitute the entire agreement of the parties and supersede in their entirety all prior undertakings and agreements of the Company and Participant with respect to the subject matter hereof.

15.8 Agreement Severable. In the event that any provision of the Grant Notice or this Agreement is held illegal or invalid, the provision will be severable from, and the illegality or invalidity of the provision will not be construed to have any effect on, the remaining provisions of the Grant Notice or this Agreement.

15.9 Limitation on Participant's Rights. Participation in the Plan confers no rights or interests other than as herein provided. This Agreement creates only a contractual obligation on the part of the Company as to amounts payable and may not be construed as creating a trust. Neither the Plan nor any underlying program, in and of itself, has any assets. Participant will have only the rights of a general unsecured creditor of the Company with respect to amounts credited and benefits payable, if any, with respect to the Option, and rights no greater than the right to receive the Shares as a general unsecured creditor with respect to the Option, as and when exercised pursuant to the terms hereof.

15.10 Not a Contract of Employment. Nothing in the Plan, the Grant Notice or this Agreement confers upon Participant any right to continue in the employ or service of the Company or any Subsidiary or interferes with or restricts in any way the rights of the Company and its Subsidiaries, which rights are hereby expressly reserved, to discharge or terminate the services of Participant at any time for any reason whatsoever, with or without Cause, except to the extent expressly provided otherwise in a written agreement between the Company or a Subsidiary and Participant.

15.11 Counterparts. The Grant Notice may be executed in one or more counterparts, including by way of any electronic signature, subject to Applicable Law, each of which will be deemed an original and all of which together will constitute one instrument.

15.12 Incentive Stock Options. If the Option is designated as an Incentive Stock Option:

(a) Participant acknowledges that to the extent the aggregate fair market value of shares (determined as of the time the option with respect to the shares is granted) with respect to which stock options intended to qualify as "incentive stock options" under Section 422 of the Code, including the

Option, are exercisable for the first time by Participant during any calendar year exceeds $100,000 or if for any other reason such stock options do not qualify or cease to qualify for treatment as "incentive stock options" under Section 422 of the Code, such stock options (including the Option) will be treated as non-qualified stock options. Participant further acknowledges that the rule set forth in the preceding sentence will be applied by taking the Option and other stock options into account in the order in which they were granted, as determined under Section 422(d) of the Code. Participant acknowledges that amendments or modifications made to the Option pursuant to the Plan that would cause the Option to become a Non-Qualified Stock Option will not materially or adversely affect Participant's rights under the Option, and that any such amendment or modification shall not require Participant's consent. Participant also acknowledges that if the Option is exercised more than three (3) months after Participant's Termination of Service as an Employee, other than by reason of death or disability, the Option will be taxed as a Non-Qualified Stock Option.

(b) Participant will give prompt written notice to the Company of any disposition or other transfer of any Shares acquired under this Agreement if such disposition or other transfer is made (a) within two (2) years from the Grant Date or (b) within one (1) year after the transfer of such Shares to Participant. Such notice will specify the date of such disposition or other transfer and the amount realized, in cash, other property, assumption of indebtedness or other consideration, by Participant in such disposition or other transfer.

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# PHATHOM PHARMACEUTICALS, INC.
# 2019 EMPLOYEE STOCK PURCHASE PLAN

## ARTICLE I.
## PURPOSE

The purposes of this Phathom Pharmaceuticals, Inc. 2019 Employee Stock Purchase Plan (as it may be amended or restated from time to time, the "***Plan***") are to assist Eligible Employees of Phathom Pharmaceuticals, Inc., a Delaware corporation (the "***Company***"), and its Designated Subsidiaries in acquiring a stock ownership interest in the Company pursuant to a plan which is intended to qualify as an "employee stock purchase plan" within the meaning of Section 423(b) of the Code, and to help Eligible Employees provide for their future security and to encourage them to remain in the employment of the Company and its Designated Subsidiaries.

## ARTICLE II.
## DEFINITIONS AND CONSTRUCTION

Wherever the following terms are used in the Plan they shall have the meanings specified below, unless the context clearly indicates otherwise. The singular pronoun shall include the plural where the context so indicates. Masculine, feminine and neuter pronouns are used interchangeably and each comprehends the others.

2.1 "***Administrator***" means the entity that conducts the general administration of the Plan as provided in Article XI. The term "Administrator" shall refer to the Committee unless the Board has assumed the authority for administration of the Plan as provided in Article XI.

2.2 "***Applicable Law***" means the requirements relating to the administration of equity incentive plans under U.S. federal and state securities, tax and other applicable laws, rules and regulations, the applicable rules of any stock exchange or quotation system on which the Common Stock is listed or quoted and the applicable laws and rules of any foreign country or other jurisdiction where rights under this Plan are granted.

2.3 "***Board***" means the Board of Directors of the Company.

2.4 "***Change in Control***" means and include each of the following:

(a) A transaction or series of transactions (other than an offering of Common Stock to the general public through a registration statement filed with the Securities and Exchange Commission or a transaction or series of transactions that meets the requirements of clauses (i) and (ii) of subsection (c) below) whereby any "person" or related "group" of "persons" (as such terms are used in Sections 13(d) and 14(d)(2) of the Exchange Act) (other than the Company, any of its Subsidiaries, an employee benefit plan maintained by the Company or any of its Subsidiaries or a "person" that, prior to such transaction, directly or indirectly controls, is controlled by, or is under common control with, the Company) directly or indirectly acquires beneficial ownership (within the meaning of Rule 13d-3 under the Exchange Act) of securities of

the Company possessing more than 50% of the total combined voting power of the Company's securities outstanding immediately after such acquisition; or

(b) During any period of two consecutive years, individuals who, at the beginning of such period, constitute the Board together with any new Director(s) (other than a Director designated by a person who shall have entered into an agreement with the Company to effect a transaction described in subsections (a) or (c)) whose election by the Board or nomination for election by the Company's stockholders was approved by a vote of at least two-thirds of the Directors then still in office who either were Directors at the beginning of the two-year period or whose election or nomination for election was previously so approved, cease for any reason to constitute a majority thereof; or

(c) The consummation by the Company (whether directly involving the Company or indirectly involving the Company through one or more intermediaries) of (x) a merger, consolidation, reorganization, or business combination or (y) a sale or other disposition of all or substantially all of the Company's assets in any single transaction or series of related transactions or (z) the acquisition of assets or stock of another entity, in each case other than a transaction:

(i) which results in the Company's voting securities outstanding immediately before the transaction continuing to represent (either by remaining outstanding or by being converted into voting securities of the Company or the person that, as a result of the transaction, controls, directly or indirectly, the Company or owns, directly or indirectly, all or substantially all of the Company's assets or otherwise succeeds to the business of the Company (the Company or such person, the "***Successor Entity***")) directly or indirectly, at least a majority of the combined voting power of the Successor Entity's outstanding voting securities immediately after the transaction, and

(ii) after which no person or group beneficially owns voting securities representing 50% or more of the combined voting power of the Successor Entity; provided, however, that no person or group shall be treated for purposes of this clause (ii) as beneficially owning 50% or more of the combined voting power of the Successor Entity solely as a result of the voting power held in the Company prior to the consummation of the transaction.

The Administrator shall have full and final authority, which shall be exercised in its sole discretion, to determine conclusively whether a Change in Control has occurred pursuant to the above definition, the date of such Change in Control and any incidental matters relating thereto.

2.5 "***Code***" means the Internal Revenue Code of 1986, as amended and the regulations issued thereunder.

2.6 "***Common Stock***" means the common stock of the Company and such other securities of the Company that may be substituted therefor pursuant to Article VIII.

2.7 "***Company***" means Phathom Pharmaceuticals, Inc., a Delaware corporation.

2.8 "***Compensation***" of an Eligible Employee means the gross base compensation received by such Eligible Employee as compensation for services to the Company or any Designated Subsidiary, including prior week adjustment and overtime payments but excluding vacation pay, holiday pay, jury duty pay, funeral leave pay, military leave pay, commissions, incentive compensation, one-time bonuses (e.g., retention or sign on bonuses), education or tuition reimbursements, travel expenses, business and moving reimbursements, income received in connection with any stock options, stock appreciation rights, restricted stock, restricted stock units or other compensatory equity awards, fringe benefits, other special payments

and all contributions made by the Company or any Designated Subsidiary for the Employee's benefit under any employee benefit plan now or hereafter established.

2.9 "***Designated Subsidiary***" means any Subsidiary designated by the Administrator in accordance with Section 11.3(b).

2.10 "***Director***" means a Board member.

2.11 "***Effectiv*e ***Date***" means the day prior to the Public Trading Date, provided that the Board has adopted the Plan prior to or on such date.

2.12 "***Eligible Employee***" means an Employee who does not, immediately after any rights under this Plan are granted, own (directly or through attribution) stock possessing 5% or more of the total combined voting power or value of all classes of Common Stock and other stock of the Company, a Parent or a Subsidiary (as determined under Section 423(b)(3) of the Code). For purposes of the foregoing sentence, the rules of Section 424(d) of the Code with regard to the attribution of stock ownership shall apply in determining the stock ownership of an individual, and stock that an Employee may purchase under outstanding options shall be treated as stock owned by the Employee; provided, however, that the Administrator may provide in an Offering Document that an Employee shall not be eligible to participate in an Offering Period if: (a) such Employee is a highly compensated employee within the meaning of Section 423(b)(4)(D) of the Code, (b) such Employee has not met a service requirement designated by the Administrator pursuant to Section 423(b)(4)(A) of the Code (which service requirement may not exceed two years), (c) such Employee's customary employment is for twenty hours or less per week, (d) such Employee's customary employment is for less than five months in any calendar year and/or (e) such Employee is a citizen or resident of a foreign jurisdiction and the grant of a right to purchase Common Stock under the Plan to such Employee would be prohibited under the laws of such foreign jurisdiction or the grant of a right to purchase Common Stock under the Plan to such Employee in compliance with the laws of such foreign jurisdiction would cause the Plan to violate the requirements of Section 423 of the Code, as determined by the Administrator in its sole discretion; provided, further, that any exclusion in clauses (a), (b), (c), (d) or (e) shall be applied in an identical manner under each Offering Period to all Employees, in accordance with Treasury Regulation Section 1.423-2(e).

2.13 "***Employee***" means any officer or other employee (as defined in accordance with Section 3401(c) of the Code) of the Company or any Designated Subsidiary. "Employee" shall not include any director of the Company or a Designated Subsidiary who does not render services to the Company or a Designated Subsidiary as an employee within the meaning of Section 3401(c) of the Code. For purposes of the Plan, the employment relationship shall be treated as continuing intact while the individual is on sick leave or other leave of absence approved by the Company or Designated Subsidiary and meeting the requirements of Treasury Regulation Section 1.421-1(h)(2). Where the period of leave exceeds three months and the individual's right to reemployment is not guaranteed either by statute or by contract, the employment relationship shall be deemed to have terminated on the first day immediately following such three-month period.

2.14 "***Enrollment Date***" means the first day of each Offering Period.

2.15 "***Exchange Act***" means the Securities Exchange Act of 1934, as amended from time to time.

2.16 "***Fair Market Value***" means, as of any date, the value of a share of Common Stock determined as follows: (a) if the Common Stock is listed on any established stock exchange, its Fair Market Value will be the closing sales price for such Common Stock as quoted on such exchange for such date, or

if no sale occurred on such date, the last day preceding such date during which a sale occurred, as reported in *The Wall Street Journal* or another source the Administrator deems reliable; (b) if the Common Stock is not traded on a stock exchange but is quoted on a national market or other quotation system, the closing sales price on such date, or if no sales occurred on such date, then on the last date preceding such date during which a sale occurred, as reported in *The Wall Street Journal* or another source the Administrator deems reliable; or (c) without an established market for the Common Stock, the Administrator will determine the Fair Market Value in its discretion.

2.17 "***Grant Date***" means the first Trading Day of an Offering Period.

2.18 "***Offering Document***" shall have the meaning given to such term in Section 4.1.

2.19 "***Offering Period***" shall have the meaning given to such term in Section 4.1.

2.20 "***Parent***" means any corporation, other than the Company, in an unbroken chain of corporations ending with the Company if, at the time of the determination, each of the corporations other than the Company owns stock possessing 50% or more of the total combined voting power of all classes of stock in one of the other corporations in such chain.

2.21 "***Participant***" means any Eligible Employee who has executed a subscription agreement and been granted rights to purchase Common Stock pursuant to the Plan.

2.22 "***Plan***" means this Phathom Pharmaceuticals, Inc. 2019 Employee Stock Purchase Plan, as it may be amended from time to time.

2.23 "***Public Trading Date***" means the first date upon which the Common Stock is listed (or approved for listing) upon notice of issuance on any securities exchange or designated (or approved for designation) upon notice of issuance as a national market security on an interdealer quotation system, or, if earlier, the date on which the Company becomes a "publicly held corporation" for purposes of Treasury Regulation Section 1.162-27(c)(1).

2.24 "***Purchase Date***" means the last Trading Day of each Purchase Period.

2.25 "***Purchase Period***" shall refer to one or more periods within an Offering Period, as designated in the applicable Offering Document; provided, however, that, in the event no Purchase Period is designated by the Administrator in the applicable Offering Document, the Purchase Period for each Offering Period covered by such Offering Document shall be the same as the applicable Offering Period.

2.26 "***Purchase Price***" means the purchase price designated by the Administrator in the applicable Offering Document (which purchase price shall not be less than 85% of the Fair Market Value of a Share on the Grant Date or on the Purchase Date, whichever is lower); provided, however, that, in the event no purchase price is designated by the Administrator in the applicable Offering Document, the purchase price for the Offering Periods covered by such Offering Document shall be 85% of the Fair Market Value of a Share on the Grant Date or on the Purchase Date, whichever is lower; provided, further, that the Purchase Price may be adjusted by the Administrator pursuant to Article VIII and shall not be less than the par value of a Share.

2.27 "***Securities Act***" means the Securities Act of 1933, as amended.

2.28 "***Share***" means a share of Common Stock.

2.29 "***Subsidiary***" means any corporation, other than the Company, in an unbroken chain of corporations beginning with the Company if, at the time of the determination, each of the corporations other than the last corporation in an unbroken chain owns stock possessing 50% or more of the total combined voting power of all classes of stock in one of the other corporations in such chain; provided, however, that a limited liability company or partnership may be treated as a Subsidiary to the extent either (a) such entity is treated as a disregarded entity under Treasury Regulation Section 301.7701-3(a) by reason of the Company or any other Subsidiary that is a corporation being the sole owner of such entity, or (b) such entity elects to be classified as a corporation under Treasury Regulation Section 301.7701-3(a) and such entity would otherwise qualify as a Subsidiary.

2.30 "***Trading Day***" means a day on which national stock exchanges in the United States are open for trading.

## ARTICLE III.
## SHARES SUBJECT TO THE PLAN

3.1 Number of Shares. Subject to Article VIII, the aggregate number of Shares that may be issued pursuant to rights granted under the Plan shall be 270,000 Shares. In addition to the foregoing, subject to Article VIII, on the first day of each calendar year beginning on January 1, 2020 and ending on and including January 1, 2029, the number of Shares available for issuance under the Plan shall be increased by that number of Shares equal to the lesser of (a) 1% of the Shares outstanding on the final day of the immediately preceding calendar year, and (b) such smaller number of Shares as determined by the Board. If any right granted under the Plan shall for any reason terminate without having been exercised, the Common Stock not purchased under such right shall again become available for issuance under the Plan. Notwithstanding anything in this Section 3.1 to the contrary, the number of Shares that may be issued or transferred pursuant to the rights granted under the Plan shall not exceed an aggregate of 10,000,000 Shares, subject to Article 8.

3.2 Stock Distributed. Any Common Stock distributed pursuant to the Plan may consist, in whole or in part, of authorized and unissued Common Stock, treasury stock or Common Stock purchased on the open market.

## ARTICLE IV.
## OFFERING PERIODS; OFFERING DOCUMENTS; PURCHASE DATES

4.1 Offering Periods. The Administrator may from time to time grant or provide for the grant of rights to purchase Common Stock under the Plan to Eligible Employees during one or more periods (each, an "***Offering Period***") selected by the Administrator. The terms and conditions applicable to each Offering Period shall be set forth in an "***Offering Document***" adopted by the Administrator, which Offering Document shall be in such form and shall contain such terms and conditions as the Administrator shall deem appropriate and shall be incorporated by reference into and made part of the Plan and shall be attached hereto as part of the Plan. The Administrator shall establish in each Offering Document one or more Purchase Periods during such Offering Period during which rights granted under the Plan shall be exercised and purchases of Shares carried out during such Offering Period in accordance with such Offering Document and the Plan. The provisions of separate Offering Periods under the Plan need not be identical.

4.2 Offering Documents. Each Offering Document with respect to an Offering Period shall specify (through incorporation of the provisions of this Plan by reference or otherwise):

(a) the length of the Offering Period, which period shall not exceed twenty-seven months;

(b) the length of the Purchase Period(s) within the Offering Period;

(c) the maximum number of Shares that may be purchased by any Eligible Employee during such Offering Period, which, in the absence of a contrary designation by the Administrator, shall be 100,000 Shares;

(d) in connection with each Offering Period that contains more than one Purchase Period, the maximum aggregate number of shares which may be purchased by any Eligible Employee during each Purchaser Period, which, in the absence of a contrary designation by the Administrator, shall be 100,000 Shares; and

(e) such other provisions as the Administrator determines are appropriate, subject to the Plan.

## ARTICLE V.
## ELIGIBILITY AND PARTICIPATION

5.1 Eligibility. Any Eligible Employee who shall be employed by the Company or a Designated Subsidiary on a given Enrollment Date for an Offering Period shall be eligible to participate in the Plan during such Offering Period, subject to the requirements of this Article V and the limitations imposed by Section 423(b) of the Code.

5.2 Enrollment in Plan.

(a) Except as otherwise set forth in an Offering Document or determined by the Administrator, an Eligible Employee may become a Participant in the Plan for an Offering Period by delivering a subscription agreement to the Company by such time prior to the Enrollment Date for such Offering Period (or such other date specified in the Offering Document) designated by the Administrator and in such form as the Company provides.

(b) Each subscription agreement shall designate a whole percentage of such Eligible Employee's Compensation to be withheld by the Company or the Designated Subsidiary employing such Eligible Employee on each payday during the Offering Period as payroll deductions under the Plan or, if permitted by the Administrator, contributions to be made by such Eligible Employee. The designated percentage may not be less than 1% and may not be more than the maximum percentage specified by the Administrator in the applicable Offering Document (which percentage shall be 20% in the absence of any such designation). The payroll deductions or, if permitted by the Administrator, contributions made for each Participant shall be credited to an account for such Participant under the Plan and shall be deposited with the general funds of the Company.

(c) A Participant may increase or decrease the percentage of Compensation designated in his or her subscription agreement, subject to the limits of this Section 5.2, or may suspend his or her payroll deductions, or, if permitted by the Administrator, contributions, at any time during an Offering Period; provided, however, that the Administrator may limit the number of changes a Participant may make to his or her payroll deduction elections or, if permitted by the Administrator, contributions, during each Offering Period in the applicable Offering Document (and in the absence of any specific designation by the Administrator, a Participant shall be allowed one change to his or her payroll deduction elections or, if permitted by the Administrator, contributions, during each Offering Period). Any such change or suspension of payroll deductions, or, if permitted by the Administrator, contributions, shall be effective with the first full payroll period that is at least five business days after the Company's receipt of the new subscription agreement (or such shorter or longer period as may be specified by the Administrator in the applicable Offering Document). In the event a Participant suspends his or her payroll deductions or

contributions, such Participant's cumulative payroll deductions or contributions prior to the suspension shall remain in his or her account and shall be applied to the purchase of Shares on the next occurring Purchase Date and shall not be paid to such Participant unless he or she withdraws from participation in the Plan pursuant to Article VII.

(d) Except as set forth in Section 5.8, as otherwise set forth in an Offering Document or determined by the Administrator, a Participant may participate in the Plan only by means of payroll deduction and may not make contributions by lump sum payment for any Offering Period.

5.3 Payroll Deductions. Except as otherwise provided in the applicable Offering Document or Section 5.8, payroll deductions for a Participant shall commence on the first payroll following the Enrollment Date and shall end on the last payroll in the Offering Period to which the Participant's authorization is applicable, unless sooner terminated by the Participant as provided in Article VII or suspended by the Participant or the Administrator as provided in Section 5.2 and Section 5.6, respectively.

5.4 Effect of Enrollment. A Participant's completion of a subscription agreement will enroll such Participant in the Plan for each subsequent Offering Period on the terms contained therein until the Participant either submits a new subscription agreement, withdraws from participation under the Plan as provided in Article VII or otherwise becomes ineligible to participate in the Plan.

5.5 Limitation on Purchase of Common Stock. An Eligible Employee may be granted rights under the Plan only if such rights, together with any other rights granted to such Eligible Employee under "employee stock purchase plans" of the Company, any Parent or any Subsidiary, as specified by Section 423(b)(8) of the Code, do not permit such employee's rights to purchase stock of the Company or any Parent or Subsidiary to accrue at a rate that exceeds $25,000 of the fair market value of such stock (determined as of the time which such rights are granted) for each calendar year in which such rights are outstanding at any time. This limitation shall be applied in accordance with Section 423(b)(8) of the Code.

5.6 Decrease or Suspension of Payroll Deductions or Contributions. Notwithstanding the foregoing, to the extent necessary to comply with Section 423(b)(8) of the Code and Section 5.5 or the other limitations set forth in this Plan, a Participant's payroll deductions or contributions may be suspended or discontinued by the Administrator at any time during an Offering Period. The balance of the amount credited to the account of each Participant that has not been applied to the purchase of Shares by reason of Section 423(b)(8) of the Code, Section 5.5 or the other limitations set forth in this Plan shall be paid to such Participant in one lump sum in cash as soon as reasonably practicable after the Purchase Date.

5.7 Foreign Employees. In order to facilitate participation in the Plan, the Administrator may provide for such special terms applicable to Participants who are citizens or residents of a foreign jurisdiction, or who are employed by a Designated Subsidiary outside of the United States, as the Administrator may consider necessary or appropriate to accommodate differences in local law, tax policy or custom. Such special terms may not be more favorable than the terms of rights granted under the Plan to Eligible Employees who are residents of the United States. Moreover, the Administrator may approve such supplements to, or amendments, restatements or alternative versions of, this Plan as it may consider necessary or appropriate for such purposes without thereby affecting the terms of this Plan as in effect for any other purpose. No such special terms, supplements, amendments or restatements shall include any provisions that are inconsistent with the terms of this Plan as then in effect unless this Plan could have been amended to eliminate such inconsistency without further approval by the stockholders of the Company.

5.8 Leave of Absence. During leaves of absence approved by the Company meeting the requirements of Treasury Regulation Section 1.421-1(h)(2) under the Code, a Participant may continue

participation in the Plan by making cash payments to the Company on his or her normal payday equal to his or her authorized payroll deduction.

## ARTICLE VI.
## GRANT AND EXERCISE OF RIGHTS

6.1 Grant of Rights. On the Grant Date of each Offering Period, each Eligible Employee participating in such Offering Period shall be granted a right to purchase the maximum number of Shares specified under Section 4.2, subject to the limits in Section 5.5, and shall have the right to buy, on each Purchase Date during such Offering Period (at the applicable Purchase Price), such number of whole Shares as is determined by dividing (a) such Participant's payroll deductions or permitted contributions accumulated prior to such Purchase Date and retained in the Participant's account as of the Purchase Date, by (b) the applicable Purchase Price (rounded down to the nearest Share). The right shall expire on the earlier of: (x) the last Purchase Date of the Offering Period, (y) last day of the Offering Period and (z) the date on which the Participant withdraws in accordance with Section 7.1 or Section 7.3.

6.2 Exercise of Rights. On each Purchase Date, each Participant's accumulated payroll deductions or permitted contributions and any other additional payments specifically provided for in the applicable Offering Document will be applied to the purchase of whole Shares, up to the maximum number of Shares permitted pursuant to the terms of the Plan and the applicable Offering Document, at the Purchase Price. No fractional Shares shall be issued upon the exercise of rights granted under the Plan, unless the Offering Document specifically provides otherwise. Any cash in lieu of fractional Shares remaining after the purchase of whole Shares upon exercise of a purchase right will be credited to a Participant's account and returned to the Participant in one lump sum payment in a subsequent payroll check as soon as practicable after the Exercise Date, unless the Administrator provides that such amounts should be rolled over to the next occurring Offering Period in the applicable Offering Document. Shares issued pursuant to the Plan may be evidenced in such manner as the Administrator may determine and may be issued in certificated form or issued pursuant to book-entry procedures.

6.3 Pro Rata Allocation of Shares. If the Administrator determines that, on a given Purchase Date, the number of Shares with respect to which rights are to be exercised may exceed (a) the number of Shares that were available for issuance under the Plan on the Enrollment Date of the applicable Offering Period, or (b) the number of Shares available for issuance under the Plan on such Purchase Date, the Administrator may in its sole discretion provide that the Company shall make a pro rata allocation of the Shares available for purchase on such Enrollment Date or Purchase Date, as applicable, in as uniform a manner as shall be practicable and as it shall determine in its sole discretion to be equitable among all Participants for whom rights to purchase Common Stock are to be exercised pursuant to this Article VI on such Purchase Date, and shall either (i) continue all Offering Periods then in effect, or (ii) terminate any or all Offering Periods then in effect pursuant to Article IX. The Company may make pro rata allocation of the Shares available on the Enrollment Date of any applicable Offering Period pursuant to the preceding sentence, notwithstanding any authorization of additional Shares for issuance under the Plan by the Company's stockholders subsequent to such Enrollment Date. The balance of the amount credited to the account of each Participant that has not been applied to the purchase of Shares shall be paid to such Participant in one lump sum in cash as soon as reasonably practicable after the Purchase Date.

6.4 Withholding. At the time a Participant's rights under the Plan are exercised, in whole or in part, or at the time some or all of the Common Stock issued under the Plan is disposed of, the Participant must make adequate provision for the Company's federal, state, or other tax withholding obligations, if any, that arise upon the exercise of the right or the disposition of the Common Stock. At any time, the Company may, but shall not be obligated to, withhold from the Participant's compensation the amount necessary for the Company to meet applicable withholding obligations, including any withholding required

to make available to the Company any tax deductions or benefits attributable to sale or early disposition of Common Stock by the Participant.

6.5 Conditions to Issuance of Common Stock. The Company shall not be required to issue or deliver any certificate or certificates for, or make any book entries evidencing, Shares purchased upon the exercise of rights under the Plan prior to fulfillment of all of the following conditions:

(a) The admission of such Shares to listing on all stock exchanges, if any, on which the Common Stock is then listed;

(b) The completion of any registration or other qualification of such Shares under any state or federal law or under the rulings or regulations of the Securities and Exchange Commission or any other governmental regulatory body, that the Administrator shall, in its absolute discretion, deem necessary or advisable;

(c) The obtaining of any approval or other clearance from any state or federal governmental agency that the Administrator shall, in its absolute discretion, determine to be necessary or advisable;

(d) The payment to the Company of all amounts that it is required to withhold under federal, state or local law upon exercise of the rights, if any; and

(e) The lapse of such reasonable period of time following the exercise of the rights as the Administrator may from time to time establish for reasons of administrative convenience.

## ARTICLE VII.
## WITHDRAWAL; CESSATION OF ELIGIBILITY

7.1 Withdrawal. A Participant may withdraw all but not less than all of the payroll deductions or contributions credited to his or her account and not yet used to exercise his or her rights under the Plan at any time by giving written notice to the Company in a form acceptable to the Company no later than one week prior to the end of the Offering Period (or such shorter or longer period specified by the Administrator in the Offering Document). All of the Participant's payroll deductions credited to his or her account or contributions made by the Participant during an Offering Period shall be paid to such Participant as soon as reasonably practicable after receipt of notice of withdrawal and such Participant's rights for the Offering Period shall be automatically terminated, and no further payroll deductions for the purchase of Shares shall be made or contributions accepted for such Offering Period. If a Participant withdraws from an Offering Period, payroll deductions shall not resume at the beginning of the next Offering Period unless the Participant timely delivers to the Company a new subscription agreement.

7.2 Future Participation. A Participant's withdrawal from an Offering Period shall not have any effect upon his or her eligibility to participate in any similar plan that may hereafter be adopted by the Company or a Designated Subsidiary or in subsequent Offering Periods that commence after the termination of the Offering Period from which the Participant withdraws.

7.3 Cessation of Eligibility. Upon a Participant's ceasing to be an Eligible Employee for any reason, he or she shall be deemed to have elected to withdraw from the Plan pursuant to this Article VII and the payroll deductions credited to such Participant's account or contributions made by such Participant during the Offering Period shall be paid to such Participant or, in the case of his or her death, to the person or persons entitled thereto under Section 12.4, as soon as reasonably practicable, and such Participant's rights for the Offering Period shall be automatically terminated.

**ARTICLE VIII.**
**ADJUSTMENTS UPON CHANGES IN STOCK**

8.1 Changes in Capitalization. Subject to Section 8.3, in the event that the Administrator determines that any dividend or other distribution (whether in the form of cash, Common Stock, other securities, or other property), Change in Control, reorganization, merger, amalgamation, consolidation, combination, repurchase, recapitalization, liquidation, dissolution, or sale, transfer, exchange or other disposition of all or substantially all of the assets of the Company, or sale or exchange of Common Stock or other securities of the Company, issuance of warrants or other rights to purchase Common Stock or other securities of the Company, or other similar corporate transaction or event, as determined by the Administrator, affects the Common Stock such that an adjustment is determined by the Administrator to be appropriate in order to prevent dilution or enlargement of the benefits or potential benefits intended by the Company to be made available under the Plan or with respect to any outstanding purchase rights under the Plan, the Administrator shall make equitable adjustments, if any, to reflect such change with respect to (a) the aggregate number and type of Shares (or other securities or property) that may be issued under the Plan (including, but not limited to, adjustments of the limitations in Section 3.1 and the limitations established in each Offering Document pursuant to Section 4.2 on the maximum number of Shares that may be purchased); (b) the class(es) and number of Shares and price per Share subject to outstanding rights; and (c) the Purchase Price with respect to any outstanding rights.

8.2 Other Adjustments. Subject to Section 8.3, in the event of any transaction or event described in Section 8.1 or any unusual or nonrecurring transactions or events affecting the Company, any affiliate of the Company, or the financial statements of the Company or any affiliate (including without limitation any Change in Control), or of changes in Applicable Law or accounting principles, the Administrator, in its discretion, and on such terms and conditions as it deems appropriate, is hereby authorized to take any one or more of the following actions whenever the Administrator determines that such action is appropriate in order to prevent the dilution or enlargement of the benefits or potential benefits intended to be made available under the Plan or with respect to any right under the Plan, to facilitate such transactions or events or to give effect to such changes in laws, regulations or principles:

(a) To provide for either (i) termination of any outstanding right in exchange for an amount of cash, if any, equal to the amount that would have been obtained upon the exercise of such right had such right been currently exercisable or (ii) the replacement of such outstanding right with other rights or property selected by the Administrator in its sole discretion;

(b) To provide that the outstanding rights under the Plan shall be assumed by the successor or survivor corporation, or a parent or subsidiary thereof, or shall be substituted for by similar rights covering the stock of the successor or survivor corporation, or a parent or subsidiary thereof, with appropriate adjustments as to the number and kind of shares and prices;

(c) To make adjustments in the number and type of Shares (or other securities or property) subject to outstanding rights under the Plan and/or in the terms and conditions of outstanding rights and rights that may be granted in the future;

(d) To provide that Participants' accumulated payroll deductions or contributions may be used to purchase Common Stock prior to the next occurring Purchase Date on such date as the Administrator determines in its sole discretion and the Participants' rights under the ongoing Offering Period(s) shall be terminated; and

(e) To provide that all outstanding rights shall terminate without being exercised.

8.3 No Adjustment Under Certain Circumstances. No adjustment or action described in this Article VIII or in any other provision of the Plan shall be authorized to the extent that such adjustment or action would cause the Plan to fail to satisfy the requirements of Section 423 of the Code.

8.4 No Other Rights. Except as expressly provided in the Plan, no Participant shall have any rights by reason of any subdivision or consolidation of shares of stock of any class, the payment of any dividend, any increase or decrease in the number of shares of stock of any class or any dissolution, liquidation, merger, or consolidation of the Company or any other corporation. Except as expressly provided in the Plan or pursuant to action of the Administrator under the Plan, no issuance by the Company of shares of stock of any class, or securities convertible into shares of stock of any class, shall affect, and no adjustment by reason thereof shall be made with respect to, the number of Shares subject to outstanding rights under the Plan or the Purchase Price with respect to any outstanding rights.

## ARTICLE IX.
## AMENDMENT, MODIFICATION AND TERMINATION

9.1 Amendment, Modification and Termination. The Administrator may amend, suspend or terminate the Plan at any time and from time to time; provided, however, that approval of the Company's stockholders shall be required to amend the Plan to: (a) increase the aggregate number, or change the type, of shares that may be sold pursuant to rights under the Plan under Section 3.1 (other than an adjustment as provided by Article VIII); (b) change the corporations or classes of corporations whose employees may be granted rights under the Plan; or (c) change the Plan in any manner that would cause the Plan to no longer be an "employee stock purchase plan" within the meaning of Section 423(b) of the Code.

9.2 Certain Changes to Plan. Without stockholder consent and without regard to whether any Participant rights may be considered to have been adversely affected, to the extent permitted by Section 423 of the Code, the Administrator shall be entitled to change or terminate the Offering Periods, limit the frequency and/or number of changes in the amount withheld from Compensation during an Offering Period, establish the exchange ratio applicable to amounts withheld in a currency other than U.S. dollars, permit payroll withholding in excess of the amount designated by a Participant in order to adjust for delays or mistakes in the Company's processing of payroll withholding elections, establish reasonable waiting and adjustment periods and/or accounting and crediting procedures to ensure that amounts applied toward the purchase of Common Stock for each Participant properly correspond with amounts withheld from the Participant's Compensation, and establish such other limitations or procedures as the Administrator determines in its sole discretion to be advisable that are consistent with the Plan.

9.3 Actions In the Event of Unfavorable Financial Accounting Consequences. In the event the Administrator determines that the ongoing operation of the Plan may result in unfavorable financial accounting consequences, the Administrator may, in its discretion and, to the extent necessary or desirable, modify or amend the Plan to reduce or eliminate such accounting consequence including, but not limited to:

(a) altering the Purchase Price for any Offering Period including an Offering Period underway at the time of the change in Purchase Price;

(b) shortening any Offering Period so that the Offering Period ends on a new Purchase Date, including an Offering Period underway at the time of the Administrator action; and

(c) allocating Shares.

Such modifications or amendments shall not require stockholder approval or the consent of any Participant.

9.4 Payments Upon Termination of Plan. Upon termination of the Plan, the balance in each Participant's Plan account shall be refunded as soon as practicable after such termination, without any interest thereon.

## ARTICLE X.
## TERM OF PLAN

The Plan shall be effective on the Effective Date. The effectiveness of the Plan shall be subject to approval of the Plan by the stockholders of the Company within twelve months following the date the Plan is first approved by the Board. No right may be granted under the Plan prior to such stockholder approval. The Plan shall be in effect until terminated under Section 9.1 hereof. No rights may be granted under the Plan during any period of suspension of the Plan or after termination of the Plan.

## ARTICLE XI.
## ADMINISTRATION

11.1 Administrator. Unless otherwise determined by the Board, the Administrator of the Plan shall be the Compensation Committee of the Board (or another committee or a subcommittee of the Board to which the Board delegates administration of the Plan) (such committee, the "***Committee***"). The Board may at any time vest in the Board any authority or duties for administration of the Plan.

11.2 Action by the Administrator. Unless otherwise established by the Board or in any charter of the Administrator, a majority of the Administrator shall constitute a quorum. The acts of a majority of the members present at any meeting at which a quorum is present and, subject to Applicable Law and the Bylaws of the Company, acts approved in writing by a majority of the Administrator in lieu of a meeting, shall be deemed the acts of the Administrator. Each member of the Administrator is entitled to, in good faith, rely or act upon any report or other information furnished to that member by any officer or other employee of the Company or any Designated Subsidiary, the Company's independent certified public accountants, or any executive compensation consultant or other professional retained by the Company to assist in the administration of the Plan.

11.3 Authority of Administrator. The Administrator shall have the power, subject to, and within the limitations of, the express provisions of the Plan:

(a) To determine when and how rights to purchase Common Stock shall be granted and the provisions of each offering of such rights (which need not be identical).

(b) To designate from time to time which Subsidiaries of the Company shall be Designated Subsidiaries, which designation may be made without the approval of the stockholders of the Company.

(c) To construe and interpret the Plan and rights granted under it, and to establish, amend and revoke rules and regulations for its administration. The Administrator, in the exercise of this power, may correct any defect, omission or inconsistency in the Plan, in a manner and to the extent it shall deem necessary or expedient to make the Plan fully effective.

(d) To amend, suspend or terminate the Plan as provided in Article IX.

(e) Generally, to exercise such powers and to perform such acts as the Administrator deems necessary or expedient to promote the best interests of the Company and its Subsidiaries and to carry out the intent that the Plan be treated as an "employee stock purchase plan" within the meaning of Section 423 of the Code.

11.4 Decisions Binding. The Administrator's interpretation of the Plan, any rights granted pursuant to the Plan, any subscription agreement and all decisions and determinations by the Administrator with respect to the Plan are final, binding, and conclusive on all parties.

## ARTICLE XII.
## MISCELLANEOUS

12.1 Restriction upon Assignment. A right granted under the Plan shall not be transferable other than by will or the applicable laws of descent and distribution, and is exercisable during the Participant's lifetime only by the Participant. Except as provided in Section 12.4 hereof, a right under the Plan may not be exercised to any extent except by the Participant. The Company shall not recognize and shall be under no duty to recognize any assignment or alienation of the Participant's interest in the Plan, the Participant's rights under the Plan or any rights thereunder.

12.2 Rights as a Stockholder. With respect to Shares subject to a right granted under the Plan, a Participant shall not be deemed to be a stockholder of the Company, and the Participant shall not have any of the rights or privileges of a stockholder, until such Shares have been issued to the Participant or his or her nominee following exercise of the Participant's rights under the Plan. No adjustments shall be made for dividends (ordinary or extraordinary, whether in cash securities, or other property) or distribution or other rights for which the record date occurs prior to the date of such issuance, except as otherwise expressly provided herein or as determined by the Administrator.

12.3 Interest. No interest shall accrue on the payroll deductions or contributions of a Participant under the Plan.

12.4 Designation of Beneficiary.

(a) A Participant may, in the manner determined by the Administrator, file a written designation of a beneficiary who is to receive any Shares and/or cash, if any, from the Participant's account under the Plan in the event of such Participant's death subsequent to a Purchase Date on which the Participant's rights are exercised but prior to delivery to such Participant of such Shares and cash. In addition, a Participant may file a written designation of a beneficiary who is to receive any cash from the Participant's account under the Plan in the event of such Participant's death prior to exercise of the Participant's rights under the Plan. If the Participant is married and resides in a community property state, a designation of a person other than the Participant's spouse as his or her beneficiary shall not be effective without the prior written consent of the Participant's spouse.

(b) Such designation of beneficiary may be changed by the Participant at any time by written notice to the Company. In the event of the death of a Participant and in the absence of a beneficiary validly designated under the Plan who is living at the time of such Participant's death, the Company shall deliver such Shares and/or cash to the executor or administrator of the estate of the Participant, or if no such executor or administrator has been appointed (to the knowledge of the Company), the Company, in its discretion, may deliver such Shares and/or cash to the spouse or to any one or more dependents or relatives of the Participant, or if no spouse, dependent or relative is known to the Company, then to such other person as the Company may designate.

12.5 Notices. All notices or other communications by a Participant to the Company under or in connection with the Plan shall be deemed to have been duly given when received in the form specified by the Company at the location, or by the person, designated by the Company for the receipt thereof.

12.6 Equal Rights and Privileges. Subject to Section 5.7, all Eligible Employees will have equal rights and privileges under this Plan so that this Plan qualifies as an "employee stock purchase plan" within the meaning of Section 423 of the Code. Subject to Section 5.7, any provision of this Plan that is inconsistent with Section 423 of the Code will, without further act or amendment by the Company, the Board or the Administrator, be reformed to comply with the equal rights and privileges requirement of Section 423 of the Code.

12.7 Use of Funds. All payroll deductions or contributions received or held by the Company under the Plan may be used by the Company for any corporate purpose, and the Company shall not be obligated to segregate such payroll deductions or contributions.

12.8 Reports. Statements of account shall be given to Participants at least annually, which statements shall set forth the amounts of payroll deductions or contributions, the Purchase Price, the number of Shares purchased and the remaining cash balance, if any.

12.9 No Employment Rights. Nothing in the Plan shall be construed to give any person (including any Eligible Employee or Participant) the right to remain in the employ of the Company or any Parent or Subsidiary or affect the right of the Company or any Parent or Subsidiary to terminate the employment of any person (including any Eligible Employee or Participant) at any time, with or without cause.

12.10 Notice of Disposition of Shares. Each Participant shall give prompt notice to the Company of any disposition or other transfer of any Shares purchased upon exercise of a right under the Plan if such disposition or transfer is made: (a) within two years from the Grant Date of the Offering Period in which the Shares were purchased or (b) within one year after the Purchase Date on which such Shares were purchased. Such notice shall specify the date of such disposition or other transfer and the amount realized, in cash, other property, assumption of indebtedness or other consideration, by the Participant in such disposition or other transfer.

12.11 Governing Law. The Plan and any agreements hereunder shall be administered, interpreted and enforced under the internal laws of the State of Delaware without regard to conflicts of laws thereof or of any other jurisdiction.

12.12 Electronic Forms. To the extent permitted by Applicable Law and in the discretion of the Administrator, an Eligible Employee may submit any form or notice as set forth herein by means of an electronic form approved by the Administrator. Before the commencement of an Offering Period, the Administrator shall prescribe the time limits within which any such electronic form shall be submitted to the Administrator with respect to such Offering Period in order to be a valid election.

**PHATHOM PHARMACEUTICALS, INC.**

**NON-EMPLOYEE DIRECTOR COMPENSATION PROGRAM**

Non-employee members of the board of directors (the "***Board***") of Phathom Pharmaceuticals, Inc. (the "***Company***") shall receive cash and equity compensation as set forth in this Non-Employee Director Compensation Program (this "***Program***"). This Program has been adopted under the Company's 2019 Incentive Award Plan (the "***Equity Plan***") and shall be effective on the Effective Date. The cash and equity compensation described in this Program shall be paid or be made, as applicable, automatically and without further action of the Board, to each member of the Board who is not an employee of the Company or any parent or subsidiary of the Company (each, a "***Non-Employee Director***") who is entitled to receive such cash or equity compensation, unless such Non-Employee Director declines the receipt of such cash or equity compensation by written notice to the Company. This Program shall remain in effect until it is revised or rescinded by further action of the Board. This Program may be amended, modified or terminated by the Board at any time in its sole discretion. The terms and conditions of this Program shall supersede any prior cash and/or equity compensation arrangements for service as a member of the Board between the Company and any of its Non-Employee Directors. No Non-Employee Director shall have any rights hereunder, except with respect to stock options granted pursuant to the Program. Capitalized terms not otherwise defined herein shall have the meanings ascribed in the Equity Plan.

1. Cash Compensation.

(a) Annual Retainers. Each Non-Employee Director shall receive an annual retainer of $40,000 for service on the Board.

(b) Additional Annual Retainers. In addition, each Non-Employee Director shall receive the following additional annual retainers, as applicable:

(i) Chairperson of the Board. A Non-Employee Director serving as Chairperson of the Board shall receive an additional annual retainer of $40,000 for such service.

(ii) Audit Committee. A Non-Employee Director serving as Chairperson of the Audit Committee shall receive an additional annual retainer of $20,000 for such service. A Non-Employee Director serving as a member of the Audit Committee (other than the Chairperson) shall receive an additional annual retainer of $10,000 for such service.

(iii) Compensation Committee. A Non-Employee Director serving as Chairperson of the Compensation Committee shall receive an additional annual retainer of $15,000 for such service. A Non-Employee Director serving as a member of the Compensation Committee (other than the Chairperson) shall receive an additional annual retainer of $7,500 for such service.

(iv) Nominating and Corporate Governance Committee. A Non-Employee Director serving as Chairperson of the Nominating and Corporate Governance Committee shall receive an additional annual retainer of $10,000 for such service. A Non-Employee Director serving as a member of

the Nominating and Corporate Governance Committee (other than the Chairperson) shall receive an additional annual retainer of $5,000 for such service.

(c) Payment of Retainers. The annual retainers described in Sections 1(a) and 1(b) shall be earned on a quarterly basis based on a calendar quarter and shall be paid by the Company in arrears not later than the fifteenth day following the end of each calendar quarter. In the event a Non-Employee Director does not serve as a Non-Employee Director, or in the applicable positions described in Section 1(b), for an entire calendar quarter, the retainer paid to such Non-Employee Director shall be prorated for the portion of such calendar quarter actually served as a Non-Employee Director, or in such position, as applicable.

2. Equity Compensation. Non-Employee Directors shall be granted the equity awards described below. The awards described below shall be granted under and shall be subject to the terms and provisions of the Equity Plan, or any other applicable Company equity incentive plan then-maintained by the Company, and shall be granted subject to the execution and delivery of award agreements, including attached exhibits, in substantially the forms previously approved by the Board. All applicable terms of the Equity Plan apply to this Program as if fully set forth herein, and all grants of stock options hereby are subject in all respects to the terms of the Equity Plan and the applicable award agreement. For the avoidance of doubt, the share numbers in this Program already give effect to the forward stock split of the Company's common stock to be effected by the Company in connection with its initial public offering.

(a) Initial Awards. Each Non-Employee Director who is initially elected or appointed to the Board after the Effective Date shall receive an option under the Equity Plan, or any other applicable Company equity incentive plan then-maintained by the Company, to purchase 20,000 shares of the Company's common stock on the date of such initial election or appointment. The awards described in this Section 2(a) shall be referred to as "***Initial Awards***." No Non-Employee Director shall be granted more than one Initial Award.

(b) Subsequent Awards. A Non-Employee Director who (i) is serving on the Board as of the date of any annual meeting of the Company's stockholders after the Effective Date and has been serving as a Non-Employee Director for at least six months as of the date of such meeting, and (ii) will continue to serve as a Non-Employee Director immediately following such meeting, shall be automatically granted an option under the Equity Plan, or any other applicable Company equity incentive plan then-maintained by the Company, to purchase 10,000 of the Company's common stock on the date of such annual meeting. The awards described in this Section 2(b) shall be referred to as "***Subsequent Awards***." For the avoidance of doubt, a Non-Employee Director elected for the first time to the Board at an annual meeting of the Company's stockholders shall only receive an Initial Award in connection with such election, and shall not receive any Subsequent Award on the date of such meeting as well.

(c) Termination of Employment of Employee Directors. Members of the Board who are employees of the Company or any parent or subsidiary of the Company who subsequently terminate their employment with the Company and any parent or subsidiary of the Company and remain on the Board will not receive an Initial Award pursuant to Section 2(a) above, but to the extent that they are otherwise entitled, will receive, after termination from employment with the Company and any parent or subsidiary of the Company, Subsequent Awards as described in Section 2(b) above.

(d) Terms of Awards Granted to Non-Employee Directors

(i) Purchase Price. The per share exercise price of each option granted to a Non-Employee Director shall equal the Fair Market Value of a share of common stock on the date the

option is granted.

(ii) Vesting. One-third of each Initial Award shall vest and become exercisable on the one (1)-year anniversary of the date of grant, and the remainder will vest in substantially equal quarterly installments over the twenty-four (24) months following the date of grant, subject to the Non-Employee Director continuing in service on the Board through each such vesting date. Each Subsequent Award shall vest and/or become exercisable on the first to occur of (A) the first anniversary of the date of grant or (B) the next occurring annual meeting of the Company's stockholders, subject to the Non-Employee Director continuing in service on the Board through such vesting date. Unless the Board otherwise determines, no portion of an Initial Award or Subsequent Award which is unvested and/or exercisable at the time of a Non-Employee Director's termination of service on the Board shall become vested and/or exercisable thereafter. Upon a Change in Control, all outstanding equity awards granted under the Equity Plan, and any other equity incentive plan maintained by the Company, that are held by a Non-Employee Director shall become fully vested and/or exercisable, irrespective of any other provisions of the Plan or any award agreement.

(iii) Term. The term of each stock option granted to a Non-Employee Director shall be ten (10) years from the date the option is granted.

3. Compensation Limits. Notwithstanding anything to the contrary in this Program, all compensation payable under this Program will be subject to any limits on the maximum amount of Non-Employee Director compensation set forth in the Equity Plan, as in effect from time to time.

4. Reimbursements. The Company shall reimburse each Non-Employee Director for all reasonable, documented, out-of-pocket travel and other business expenses incurred by such Non-Employee Director in the performance of his or her duties to the Company in accordance with the Company's applicable expense reimbursement policies and procedures as in effect from time to time.

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**Exhibit 23.1**

**Consent of Independent Registered Public Accounting Firm**

We consent to the reference to our firm under the caption “Experts” and to the use of our report dated July 26, 2019 (except for the last paragraph of Note 8, as to which the date is October 15, 2019) in Amendment No.1 to the Registration Statement on Form S-1 (No. 333-234020) and related Prospectus of Phathom Pharmaceuticals, Inc. for the registration of shares of its common stock.

/s/ Ernst & Young LLP

San Diego, California
October 15, 2019