UNITED STATES
SECURITIES AND EXCHANGE COMMISSION

Washington, D.C. 20549

FORM 10-K

☒ **ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the fiscal year ended December 31, 2020

OR

☐ **TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the transition period from _____ to _____

Commission File Number 001-38697

PhaseBio Pharmaceuticals, Inc.

(Exact name of registrant as specified in its charter)

Delaware	**03-0375697**
(State or other jurisdiction of incorporation or organization)	**(I.R.S. Employer Identification No.)**

1 Great Valley Parkway, Suite 30
Malvern, Pennsylvania 19355
(Address including zip code of principal executive offices)

(610) 981-6500
(Registrant's telephone number, including area code)

Securities registered pursuant to Section 12(b) of the Act:

(Title of Class)	**Trading Symbol**	**(Name of exchange on which registered)**
Common Stock, par value $0.001 per share	**PHAS**	**The Nasdaq Stock Market, LLC**

Securities registered pursuant to section 12(g) of the Act: **None**

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. Yes ☐ No ☒

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Act. Yes ☐ No ☒

Indicate by check mark whether the registrant: (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes ☒ No ☐

Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit such files). Yes ☒ No ☐

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 13(a) of the Exchange Act. ☒

Indicate by check mark whether the registrant has filed a report on and attestation to its management's assessment of the effectiveness of its internal control over financial reporting under Section 404(b) of the Sarbanes-Oxley Act (15 U.S.C. 7262(b)) by the registered public accounting firm that prepared or issued its audit report. ☐

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act). Yes ☐ No ☒

The aggregate market value of the voting and non-voting common equity held by non-affiliates of the registrant as of June 30, 2020 was approximately $120.5 million based on the closing price on the Nasdaq Global Market reported for such date. Shares of common stock held by each officer and director and by each person who is known to own 10% or more of the outstanding common stock have been excluded in that such persons may be deemed to be affiliates of the registrant. This determination of affiliate status is not necessarily a conclusive determination for other purposes.

Class of Common Stock	**Outstanding Shares as of March 11, 2021**
Common Stock, $0.001 par value	29,443,225

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the registrant's definitive proxy statement, to be filed pursuant to Regulation 14A under the Securities Exchange Act of 1934, for its 2021 Annual Meeting of Stockholders are incorporated by reference in Part III of this Form 10-K.

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SPECIAL CAUTIONARY NOTICE REGARDING FORWARD-LOOKING STATEMENTS

This Annual Report on Form 10-K, or this Annual Report, contains forward-looking statements within the meaning of Section 27A of the Securities Act of 1933, as amended, or the Securities Act, and Section 21E of the Securities Exchange Act of 1934, as amended, or the Exchange Act, that involve substantial risks and uncertainties. The forward-looking statements are contained principally in Part I, Item 1. “Business,” Part I, Item 1A. “Risk Factors,” and Part II, Item 7. “Management’s Discussion and Analysis of Financial Condition and Results of Operations,” but are also contained elsewhere in this Annual Report. In some cases, you can identify forward-looking statements by the words “may,” “might,” “will,” “could,” “would,” “should,” “expect,” “intend,” “plan,” “objective,” “anticipate,” “believe,” “estimate,” “predict,” “project,” “potential,” “continue” and “ongoing,” or the negative of these terms, or other comparable terminology intended to identify statements about the future. These statements involve known and unknown risks, uncertainties and other factors that may cause our actual results, levels of activity, performance or achievements to be materially different from the information expressed or implied by these forward-looking statements. Although we believe that we have a reasonable basis for each forward-looking statement contained in this Annual Report, we caution you that these statements are based on a combination of facts and factors currently known by us and our expectations of the future, about which we cannot be certain. Forward-looking statements include statements about:

- the timing, progress and results of clinical trials of bentracimab, pemziviptadil, PB6440 and any other potential product candidates, including statements regarding the timing of initiation and completion of preclinical studies or clinical trials and related preparatory work, the period during which the results of the trials will become available and our research and development programs;
- the timing of any submission of filings for regulatory approval of bentracimab, pemziviptadil, PB6440 and any other product candidates and our ability to obtain and maintain regulatory approvals for bentracimab, pemziviptadil, PB6440 or any other product candidates for any indication;
- our expectations regarding the size of the patient populations, market acceptance and opportunity for and clinical utility of our product candidates, if approved for commercial use;
- our manufacturing capabilities and strategy, including the scalability and commercial viability of our manufacturing methods and processes and our ability to maintain agreements with third parties;
- our expectations regarding the scope of any approved indications for bentracimab, pemziviptadil and PB6440;
- our ability to successfully commercialize our product candidates;
- our ability to leverage our proprietary elastin-like polypeptide technology to identify and develop future product candidates;
- the potential effects of COVID-19 on our business, operations and clinical development timelines and plans;
- our estimates of our expenses, ongoing losses, future revenue, capital requirements and our needs for or ability to obtain additional financing;
- our ability to establish or maintain collaborations or strategic relationships;
- our ability to identify, recruit and retain key personnel;
- our ability to protect and enforce our intellectual property position for our product candidates and our research and development programs, and the scope of such protection;
- our financial performance;
- our competitive position and the development of and projections relating to our competitors or our industry;
- the impact of laws and regulations; and
- our expectations regarding the time during which we will be an emerging growth company under the JOBS Act.

You should refer to “Item 1A. Risk Factors” in this Annual Report for a discussion of important factors that may cause our actual results to differ materially from those expressed or implied by our forward-looking statements. As a result of these factors, we cannot assure you that the forward-looking statements in this Annual Report will prove to be accurate. Furthermore, if our forward-looking statements prove to be inaccurate, the inaccuracy may be material. In light of the

significant uncertainties in these forward-looking statements, you should not regard these statements as a representation or warranty by us or any other person that we will achieve our objectives and plans in any specified time frame, or at all. The forward-looking statements in this Annual Report represent our views as of the date of this Annual Report. We anticipate that subsequent events and developments may cause our views to change. However, while we may elect to update these forward-looking statements at some point in the future, we undertake no obligation to publicly update any forward-looking statements, whether as a result of new information, future events or otherwise, except as required by law. You should, therefore, not rely on these forward-looking statements as representing our views as of any date subsequent to the date of this Annual Report.

You should read this report and the documents that we reference in this report, completely and with the understanding that our actual future results may be materially different from what we expect. We qualify all of our forward-looking statements by these cautionary statements.

All brand names or trademarks appearing in this Annual Report are the property of their respective owners. Solely for convenience, the trademarks and trade names in this Annual Report are referred to without the symbols ® and ™, but such references should not be construed as any indication that their respective owners will not assert, to the fullest extent under applicable law, their rights thereto. Unless the context requires otherwise, references in this report to “PhaseBio,” the “Company,” “we,” “us,” and “our” refer to PhaseBio Pharmaceuticals, Inc.

PART I

Item 1. Business.

Overview

We are a clinical-stage biopharmaceutical company focused on the development and commercialization of novel therapies for cardiopulmonary diseases. Our lead product candidate, bentracimab (also known as PB2452), is a novel reversal agent for the antiplatelet drug ticagrelor, which we are developing for the reversal of the antiplatelet effects of ticagrelor in patients with uncontrolled major or life-threatening bleeding or requiring urgent surgery or an invasive procedure. Based on feedback from the United States Food and Drug Administration, or FDA, we intend to seek approval of bentracimab in the United States through an accelerated approval process. In our completed Phase 2a clinical trial of bentracimab, we observed immediate and complete reversal of ticagrelor's antiplatelet activity within five minutes following initiation of infusion and sustained reversal for over 20 hours. Bentracimab has been generally well tolerated in our completed trials, with no drug-related serious adverse events, or SAEs. We are currently conducting a Phase 2b trial and our pivotal Phase 3 REVERSE-IT trial of bentracimab. We are developing bentracimab pursuant to a co-development agreement, or the SFJ Agreement, with SFJ Pharmaceuticals X, Ltd., an SFJ Pharmaceuticals Group company, or SFJ. Under the SFJ Agreement, SFJ has agreed to pay us up to $120.0 million to support the clinical development of bentracimab. Our second product candidate, pemziviptadil (also known as PB1046), is a once-weekly fusion protein currently in a Phase 2b clinical trial for the treatment of pulmonary arterial hypertension, or PAH. Pemziviptadil utilizes our proprietary half-life extending elastin-like polypeptide, or ELP, technology, which also serves as an engine for our preclinical pipeline. As we advance our clinical programs for bentracimab and pemziviptadil with site activations and patient enrollment, we remain in close contact with our clinical research organizations, clinical sites and suppliers to attempt to assess the impacts that COVID-19 may have on our clinical trials and current timelines and to consider whether we can implement appropriate mitigating measures to help lessen such impacts. At this time, however, we cannot fully forecast the scope of impacts that COVID-19 may have on our ability to initiate trial sites, enroll and assess patients, supply study drug and report trial results. We are also developing our preclinical product candidate, PB6440, for treatment-resistant hypertension. We retain worldwide commercial rights to all of our product candidates.

Bentracimab

Bentracimab is a novel recombinant human monoclonal antibody antigen-binding fragment, or Fab fragment, designed to reverse the antiplatelet activity of ticagrelor. Ticagrelor is an antiplatelet therapy widely prescribed to reduce the rates of death, heart attack and stroke in patients with acute coronary syndrome, or ACS, or who have previously experienced a heart attack. The American College of Cardiology, American Heart Association and European Society of Cardiology guidelines recognize ticagrelor as the preferred antiplatelet therapy for ACS. In 2020, ticagrelor, currently marketed by AstraZeneca plc, or AstraZeneca, under the brand names Brilinta and Brilique, had worldwide sales of $1.6 billion. Ticagrelor binds to platelets to prevent them from forming blood clots, which could restrict blood flow to critical organs in these patients, causing heart attacks or strokes. Due to ticagrelor's antiplatelet activity, patients on ticagrelor have an elevated risk of spontaneous bleeding. In addition, patients on ticagrelor who need urgent surgery cannot wait the recommended five days for ticagrelor's effect to dissipate and are at increased risk of major bleeding during and after surgery. There are currently no other known reversal agents approved or in clinical development for ticagrelor or any other antiplatelet drugs. In the European Union, an extracorporeal whole blood purification adsorber device is available that may be useful for non-specific removal of ticagrelor during some cardiac procedures when used in conjunction with cardiopulmonary bypass. Upon approval, bentracimab would be the only therapeutic agent available for specific reversal of ticagrelor. We believe the availability of bentracimab as a specific reversal agent could expand ticagrelor's use by mitigating concerns regarding bleeding risk and uniquely position ticagrelor as the only oral antiplatelet drug with a reversal agent. In our Phase 1 and Phase 2a clinical trials, bentracimab achieved immediate and complete reversal of ticagrelor's antiplatelet activity, with potential customizable duration of reversal based on the dosing regimen, which we believe has the potential to bring life-saving therapeutic benefit to these patients by increasing the safety of ticagrelor.

In September 2019, we completed a Phase 2a clinical trial of bentracimab in older and elderly subjects dosed with ticagrelor and aspirin and in healthy younger subjects on supratherapeutic doses of ticagrelor. In this trial, we observed a statistically significant reversal of ticagrelor within five minutes of initiation of bentracimab infusion, which was sustained for over 20 hours. Platelet function was normalized by 15 minutes, 30 minutes for the supratherapeutic ticagrelor-dose cohort, following initiation of bentracimab infusion and remained normal for over 20 hours. Bentracimab was generally well tolerated, with only minor adverse events, or AEs, reported. These results are consistent with results observed in healthy younger subjects treated with ticagrelor in our Phase 1 trial. The older and elderly subjects in the Phase 2a trial resembled the patient population most likely to be treated with ticagrelor and to potentially benefit from bentracimab, if approved.

In March 2020, we commenced our pivotal REVERSE-IT trial, a global, multi-center, non-randomized, open-label trial in which we plan to enroll a total of 200 ticagrelor patients with uncontrolled major or life-threatening bleeding or requiring urgent surgery or an invasive procedure. The primary endpoints for this trial are the reversal of the antiplatelet effects of ticagrelor with intravenous infusion of bentracimab as measured by the VerifyNow® PRUTest® biomarker and achievement of clinical hemostasis in enrolled patients. We are currently enrolling patients in the United States, the European Union and Canada in this trial.

The FDA granted Breakthrough Therapy designation for bentracimab in April 2019. The European Medicines Agency, or the EMA, granted bentracimab Priority Medicines, or PRIME, designation in February 2020. Based on feedback from the FDA, we intend to submit a Biologics License Application, or BLA, for potential accelerated approval based on an interim analysis of the first approximately 100 patients treated in our REVERSE-IT trial, targeting that approximately one half of patients enrolled have uncontrolled major or life-threatening bleeding and approximately one half require urgent surgery or an invasive procedure. After we submit our BLA with data from the first 100 patients, we intend to complete the REVERSE-IT trial and establish a post-approval registry in accordance with FDA requirements. The Committee for Medicinal Products for Human Use, or CHMP, of the EMA has also generally agreed with our proposed clinical development plan for bentracimab.

We have enrolled more than half of the first approximately 100 patients needed to support our BLA submission, nearly all of whom to date have required urgent surgery or an invasive procedure. We are attempting to accelerate enrollment of patients with uncontrolled major or life-threatening bleeding, including by working to increase the number of enrolling clinical trial sites in the United States, Canada, and the European Union as we believe that a broader site footprint will increase the probability of enrolling these patients. All of the first approximately 100 patients enrolled in the REVERSE-IT trial will be measured against the same VerifyNow PRUTest biomarker described above.

We expect to complete enrollment of the first 100 patients in the REVERSE-IT trial in mid-2021, and are targeting to submit our BLA for bentracimab in mid-2022, although those timelines could be impacted by the continued scope and duration of the COVID-19 pandemic.

Pemziviptadil

Pemziviptadil is being developed as a once-weekly, novel treatment for PAH, a progressive, life-threatening, orphan disease caused by vasoconstriction and structural deterioration of the pulmonary arteries, which can lead to heart failure and, eventually, death. Pemziviptadil is a subcutaneously-injected, sustained-release analogue of the native human peptide vasoactive intestinal peptide, or VIP. VIP is a neurohormone that relaxes the muscles surrounding blood vessels, causing them to dilate, which results in improved blood flow. In contrast to the currently approved therapies for PAH, which only target vasodilation, we believe that VIP also suppresses the adverse remodeling of blood vessels and increases cardiac contractility and relaxation. We believe that pemziviptadil has the potential to be disease-modifying and complementary to current standard-of-care therapies for PAH.

We have completed two clinical trials of subcutaneously-injected pemziviptadil in subjects with cardiovascular diseases. In these trials, pemziviptadil was observed to be well tolerated, with no SAEs considered to be drug-related and resulting in study drug discontinuation. In both trials, we observed that patients who received pemziviptadil experienced statistically significant reductions in blood pressure that were sustained for at least one week, with no reported episodes of symptomatic hypotension. We have also completed enrollment of an exploratory Phase 1b/2a clinical trial to evaluate the effects of pemziviptadil on pulmonary arterial pressure in PAH patients with a CardioMEMS device, an implanted hemodynamic monitor that continuously reports pulmonary arterial pressure and cardiac function. In preliminary results from this trial, we observed reductions in pulmonary arterial pressure and increases in cardiac output, which we believe are consistent with potential beneficial effects of pemziviptadil. We are currently dosing patients in a randomized, double-blinded, controlled Phase 2b clinical trial in which we plan to enroll approximately 60 PAH patients to assess the safety, tolerability and efficacy of pemziviptadil. This clinical trial will evaluate the effects of pemziviptadil on pulmonary arterial pressure and exercise tolerance, including the distance the patient can walk in six minutes, which is an important clinical endpoint that the FDA has previously used as the basis for approval of other PAH drugs. We are targeting to report the top-line results of this trial in the second half of 2021, although that timeline could be impacted by the continued scope and duration of the COVID-19 pandemic.

Pemziviptadil and certain other preclinical product candidates, are based on our proprietary ELP technology. Our ELP technology extends the circulating half-life of proteins and peptides and also provides a sustained-release mechanism, resulting in exposure of active molecules for periods of a week or longer from a single subcutaneous injection. We believe that our ELP technology enhances solubility, stability and bioavailability, provides extended drug exposure and creates product candidates that are straightforward to manufacture and administer. Our strategy is to apply our ELP technology to proteins and peptides with well-characterized therapeutic activities but suboptimal half-lives to improve their pharmacokinetics, enable their

use as pharmaceutical products and allow for more convenient dosing regimens. To date, we have not observed any SAEs considered to be drug-related and resulting in study drug discontinuation in any of the over 500 subjects in clinical trials of our ELP product candidates.

PB6440

PB6440 is a highly selective aldosterone synthase inhibitor being developed for treatment-resistant hypertension. In preclinical studies to date, PB6440 demonstrated dose-dependent aldosterone reduction without a significant increase in 11-deoxycorticosterone or deoxycortisol in both rodent and primate models. The oral bioavailability and pharmacokinetic profiles observed in these preclinical studies appear suitable for once-daily oral dosing in humans. To date, no evidence of toxicity has been observed in either *in vitro* toxicity studies or in animal models, including primates. We currently plan to initiate nonclinical Investigational New Drug Application, or IND, -enabling studies for PB6440 in 2021, which are expected to be followed by an IND filing and a first-in-human trial in 2022.

Strategy

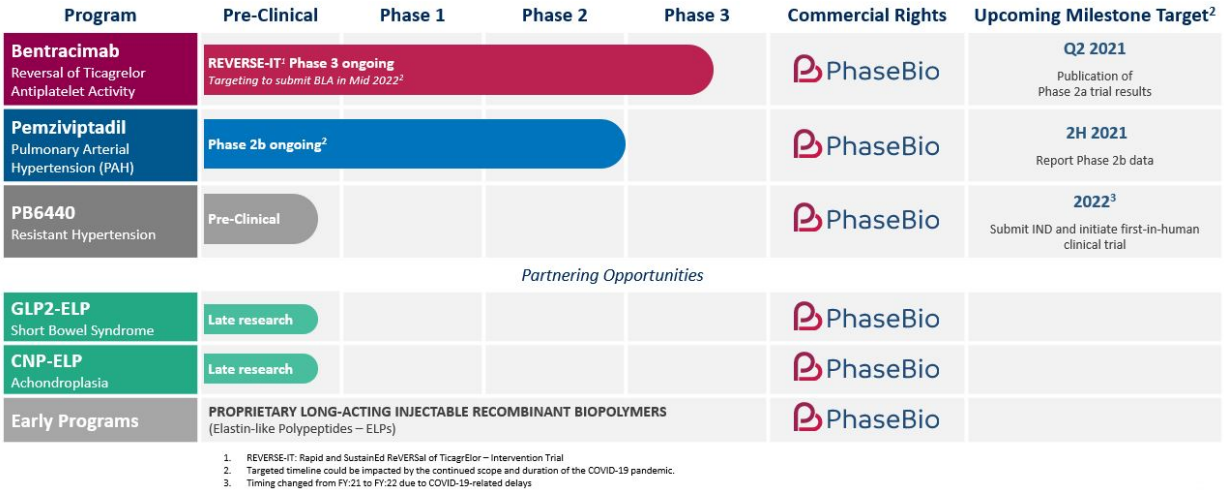
Our strategy is to identify, develop and commercialize novel therapies for cardiopulmonary diseases. The key elements of our strategy include:

- ***Continue to advance bentracimab through clinical development and regulatory approval***. We intend to develop and commercialize bentracimab as a novel reversal agent for the antiplatelet drug ticagrelor. In September 2019, we announced the completion of a Phase 2a clinical trial of bentracimab in older and elderly subjects dosed with ticagrelor and aspirin and in healthy younger subjects on supratherapeutic doses of ticagrelor. In October 2019, we initiated a multi-center Phase 2b clinical trial in healthy older and elderly subjects. In March 2020, in collaboration with SFJ, we commenced our pivotal REVERSE-IT trial in patients on ticagrelor with uncontrolled major or life-threatening bleeding or requiring urgent surgery or an invasive procedure, and we plan to perform an interim assessment of an initial subset of patients in this trial. We are currently enrolling patients in the REVERSE-IT trial in the United States, the European Union and Canada. We have received Breakthrough Therapy designation and plan to submit a BLA seeking accelerated approval of bentracimab prior to completion of the REVERSE-IT trial, based on biomarker data from an initial subset of the REVERSE-IT patients. The EMA granted bentracimab PRIME designation, and the CHMP has generally agreed with our clinical development plan.
- ***Continue to develop pemziviptadil***. We intend to advance pemziviptadil through clinical trials as a once-weekly novel treatment for PAH that is vasodilatory, potentially disease-modifying and complementary to the current standard of care therapies. We are currently conducting a Phase 2b clinical trial of pemziviptadil. Based on the results of this trial, we intend to advance this product candidate into Phase 3 clinical development for the treatment of PAH.
- ***Broaden the potential therapeutic applications of pemziviptadil***. Due to improvements in pharmacokinetics that we have observed with our ELP technology, we believe that the therapeutic potential of VIP can be applied to a variety of other orphan indications. Preclinical data suggest pemziviptadil may have clinical benefit in cardiomyopathy associated with Duchenne Muscular Dystrophy, or DMD, heart failure and other cardiomyopathies and in cystic fibrosis. As such, we intend to strategically broaden the therapeutic applications of pemziviptadil by exploring its development in additional indications.
- ***Continue the preclinical development of PB6440 for treatment-resistant hypertension.*** We are planning to initiate IND-enabling studies for PB6440 in 2021. We expect to file an IND for PB6440 with the FDA in order to initiate a first-in-human trial in 2022.
- ***Leverage our ELP technology platform to expand our development pipeline***. We believe that our ELP technology enhances solubility, stability and bioavailability, provides extended drug exposure and creates product candidates that are straightforward to manufacture and administer. As such, we plan to utilize our platform to identify product candidates for additional indications. We intend to apply our ELP technology to improve the pharmacokinetics of proteins and peptides with well-characterized therapeutic activities but suboptimal half-lives, in order to improve their pharmacokinetics, enable their use as pharmaceutical products and allow for more convenient dosing regimens.
- ***Commercialize our product candidates***. We have entered into exclusive license agreements with AstraZeneca for bentracimab and Duke University, or Duke, for our ELP technology, pursuant to which we retain worldwide commercial rights to our product candidates. In addition, we own all of the assets

and intellectual property rights related to PB6440. If approved, we intend to commercialize bentracimab and PB6440 independently in the United States and through partnerships in international markets. We intend to explore collaborations or partnerships to commercialize pemziviptadil, if approved. As we advance towards regulatory approvals for our product candidates, we intend to establish a focused marketing and sales infrastructure.

Pipeline

Our preclinical and clinical-stage pipeline is set forth below:



Bentracimab: Antiplatelet Therapy Reversal Agent for Ticagrelor

Our lead product candidate, bentracimab, is a novel ticagrelor reversal agent, which we are developing for the reversal of the antiplatelet effects of ticagrelor in patients with uncontrolled major or life-threatening bleeding or requiring urgent surgery or an invasive procedure. In September 2019, we completed a Phase 2a clinical trial of bentracimab in older and elderly subjects and in healthy younger subjects on supratherapeutic doses of ticagrelor, in which we observed a statistically significant reversal of ticagrelor within five minutes of initiation of bentracimab infusion, which was sustained for over 20 hours. We are currently conducting a Phase 2b clinical trial of bentracimab and our pivotal REVERSE-IT trial.

Background on Acute Coronary Syndrome

ACS describes a range of conditions associated with sudden reduced blood flow to the heart, including unstable angina and myocardial infarction, or heart attack. ACS is caused by the inappropriate formation of clots in the coronary arteries. These blood clots are made up primarily of platelets, small lens-shaped cells found in the blood that normally aggregate at sites of injury to help stop bleeding. According to the Centers for Disease Control and Prevention, approximately 805,000 Americans have a heart attack every year, and heart attacks are a leading cause of death in the developed world.

The primary treatment for ACS is the use of antiplatelet drugs to prevent the worsening of existing clots or to reduce the formation of additional clots. These clots can occur in the heart or in stents that are placed in the blocked coronary artery to keep the blood vessel open or elsewhere in the body. Without antiplatelet drugs, patients are at a significantly increased risk of recurrent heart attacks, stroke and death. The standard of care for ACS patients is dual antiplatelet therapy, or DAPT, which is a combination of aspirin and an inhibitor of a specific receptor found on platelets known as the $P2Y_{12}$ receptor. This combination is started after a patient experiences a heart attack or other manifestation of ACS and has been shown to significantly reduce platelet aggregation and clot formation and reduce the frequency of recurrent heart attacks, stroke and death.

While the antiplatelet drugs used in DAPT have proven effective at improving overall outcomes in ACS patients, their suppression of blood clotting increases patients' risk of bleeding. Bleeding events in patients on antiplatelet therapy, which can occur spontaneously or as a result of injury or surgery, are classified as minor or major. In the 18,000-patient clinical trial, Platelet Inhibition and Patient Outcomes, or PLATO, conducted by AstraZeneca, ticagrelor was shown to be superior to the antiplatelet drug clopidogrel, marketed under the brand name Plavix, in reducing recurrent heart attack, stroke and death in

patients with ACS. However, in both treatment groups, approximately 11% to 12% of patients in the trial suffered major bleeding events, and in approximately 6% of patients, these major bleeding events were fatal or life-threatening. The causes of bleeding varied in the trial population. In approximately 3% of the patients on ticagrelor, the major bleeding events were spontaneous and not related to any medical procedure, whereas approximately 9% of patients on ticagrelor developed major bleeding that was related to procedures like coronary artery bypass surgery, or CABG. Although the trial protocol recommended that patients who needed CABG stop taking ticagrelor for one to three days prior to surgery, nearly half of all ticagrelor patients needed surgery urgently and could not wait the up to three days for ticagrelor's effect to dissipate so normal blood clotting could be restored. Overall, up to 80% of patients who underwent CABG surgery in the trial suffered a major or life-threatening bleeding event related to the surgery, and for those who needed urgent surgery and could not wait three days for the effects of ticagrelor to dissipate, approximately 50% experienced a fatal or life-threatening bleeding event. While some of this risk was likely associated with patients' underlying conditions, the overall bleeding risk is significantly increased by antiplatelet drugs, and the current United States and European prescribing information for ticagrelor suggests suspension of ticagrelor treatment for five days prior to surgery.

Despite the increased bleeding risk, antiplatelet drugs, along with anticoagulant drugs that are used to prevent clots in veins, represent some of the most widely prescribed drugs in the United States due to their lifesaving effects. There are currently no other known reversal agents approved or in clinical development for ticagrelor or any other antiplatelet drugs. In the European Union, an extracorporeal whole blood purification adsorber device is available that may be useful for non-specific removal of ticagrelor during some cardiac procedures when used in conjunction with cardiopulmonary bypass. Upon approval, bentracimab would be the only therapeutic agent available for specific reversal of ticagrelor. In the absence of a specific reversal agent, physicians have limited treatment options, and sometimes administer platelet transfusions, which are unproven in this setting. The ability to quickly reverse the antiplatelet activity of ticagrelor and restore normal clotting would increase its safety, both in instances of major bleeding as well as in situations where surgical or other medical interventions associated with bleeding are urgently needed.

Background on Antiplatelet Drugs

The three oral antiplatelet $P2Y_{12}$ receptor antagonist drugs prescribed in DAPT are clopidogrel, marketed under the brand name Plavix; prasugrel, marketed under the brand name Effient; and ticagrelor, marketed under the brand names Brilinta and Brilique. Unlike clopidogrel and prasugrel that permanently bind to and inhibit the target receptors on platelets, ticagrelor binds to the $P2Y_{12}$ receptor in a transient manner, quickly cycling on and off the receptor. We believe this transient binding of ticagrelor presents a unique opportunity to develop a specific reversal agent for ticagrelor, whereas the permanent binding of the other drugs to the receptor precludes a reversal agent from being developed.

We consider ticagrelor to be the best-in-class $P2Y_{12}$ antiplatelet agent because it has demonstrated a superior benefit-risk profile compared to other products in the $P2Y_{12}$ class. In 2020, ticagrelor had worldwide sales of $1.6 billion. Ticagrelor has achieved this level of market share despite the availability of generic versions of clopidogrel and prasugrel. We believe ticagrelor growth is being driven in part by treatment guidelines from the American College of Cardiology, American Heart Association and the European Society of Cardiology that recognize ticagrelor as the preferred antiplatelet treatment for ACS. We believe that the availability of a reversal agent could further drive the use of ticagrelor by making it the only reversible oral $P2Y_{12}$ antiplatelet treatment, thereby conferring a possible safety benefit over the other agents. Furthermore, based on the growth of clopidogrel prescriptions after the introduction of a generic form of that drug, we believe ticagrelor prescriptions could grow significantly after its patents expire in 2024 and generic competition drives prices down to similar levels as other $P2Y_{12}$ antiplatelet therapies.

Our Solution: Bentracimab

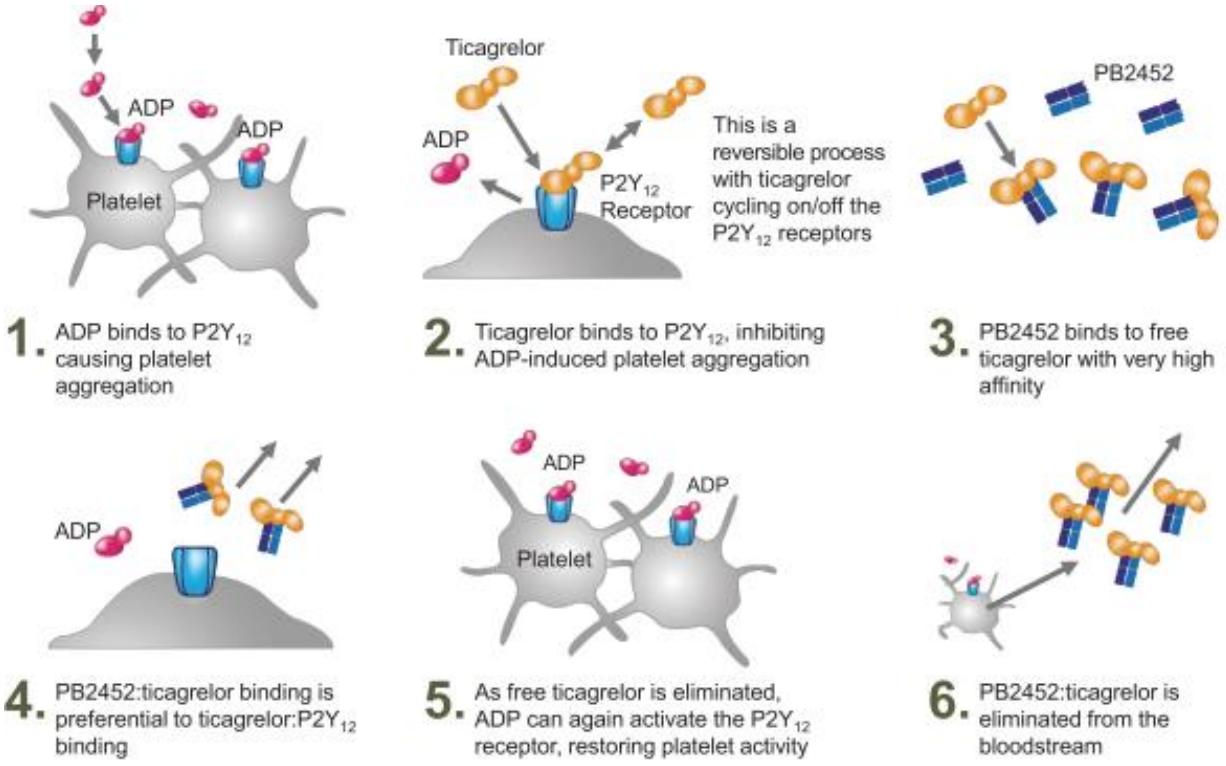
Bentracimab is a human Fab fragment that binds to ticagrelor with high affinity and specificity to reverse ticagrelor's antiplatelet activity. We believe that the availability of bentracimab may further differentiate ticagrelor from other $P2Y_{12}$ receptor antagonists by providing for better clinical management of the balance between the desired antiplatelet effect and prevention or control of bleeding. We exclusively licensed bentracimab from MedImmune Limited, or MedImmune, a wholly-owned subsidiary of AstraZeneca.

Bentracimab Background

Ticagrelor works by binding to the $P2Y_{12}$ receptor on platelets, thereby preventing adenosine diphosphate, or ADP, from causing platelet aggregation. Ticagrelor binds transiently to the $P2Y_{12}$ receptor, quickly cycling on and off, and allowing bentracimab to bind to free ticagrelor, thereby preventing ticagrelor's inactivation of the receptor and removing

ticagrelor from circulation. With ticagrelor removed, ADP can once again activate the $P2Y_{12}$ receptor and induce platelet aggregation. This activity is illustrated below.

Mechanism of action of ticagrelor and its reversal by bentracimab



Bentracimab binds to ticagrelor with an affinity that is approximately 100 times stronger than ticagrelor's affinity for the $P2Y_{12}$ receptor. This high affinity enables bentracimab to bind to free ticagrelor, resulting in an immediate reversal of ticagrelor's effect and restoration of platelet activity.

Clinical Development of Bentracimab

Phase 3 REVERSE-IT Clinical Trial

In March 2020, we commenced our pivotal REVERSE-IT trial. We expect to enroll a total of 200 ticagrelor patients with uncontrolled major or life-threatening bleeding or requiring urgent surgery or an invasive procedure in this global, multi-center, non-randomized, open-label trial and file for an accelerated approval based upon approximately 100 patients. The primary endpoints for this trial are the reversal of the antiplatelet effects of ticagrelor with intravenous infusion of bentracimab as measured by the VerifyNow® PRUTest® biomarker and achievement of clinical hemostasis in enrolled patients.

Phase 2b Clinical Trial

In October 2019, we initiated a Phase 2b trial of bentracimab. The multi-center, randomized, double-blind, placebo-controlled trial is designed to evaluate the safety and efficacy of bentracimab in reversing the antiplatelet effects of ticagrelor as part of a dual antiplatelet regimen including low-dose aspirin. Approximately 200 older and elderly (ages 50-80) subjects are expected to be enrolled, resembling the patient population most likely to be treated with ticagrelor and potentially benefit from bentracimab, if approved. Subjects will be randomized in a ratio of 3:1 and will receive either bentracimab or placebo, with approximately 150 subjects receiving bentracimab. The primary endpoint of the trial is reversal of the antiplatelet

effects of ticagrelor with intravenous infusion of bentracimab or placebo, as measured by the VerifyNow PRUTest biomarker. We expect that the results of this trial will further support our BLA safety database.

Phase 2a Clinical Trial

In September 2019, we completed a Phase 2a clinical trial of bentracimab in older and elderly subjects dosed with ticagrelor and aspirin and in healthy younger subjects on supratherapeutic doses of ticagrelor. We observed a statistically significant reversal of ticagrelor within five minutes of initiation of bentracimab infusion, which was sustained for over 20 hours. Platelet function was normalized by 15 minutes (30 minutes for the supratherapeutic ticagrelor-dose cohort) following initiation of bentracimab infusion and remained normal for over 20 hours. Bentracimab was generally well tolerated, with only minor AEs reported. These results are consistent with results observed in healthy younger subjects treated with ticagrelor in our Phase 1 trial. The older and elderly subjects in the Phase 2a trial resemble the patient population most likely to be treated with ticagrelor and to potentially benefit from bentracimab, if approved.

Phase 1 Clinical Trial

In September 2018, we completed a Phase 1 dose escalation clinical trial of bentracimab, delivered as an intravenous infusion in healthy subjects pre-dosed with ticagrelor that was designed to identify the target dose, determine proof of concept and evaluate the safety and tolerability of bentracimab. In the trial, we observed that bentracimab immediately and completely reversed the antiplatelet effects of ticagrelor. We conducted this trial pursuant to an IND application that we sponsored and that became effective in March 2018. In March 2019, the full results from this trial of bentracimab were published in the *New England Journal of Medicine.*

Our Phase 1 clinical trial enrolled 64 subjects across 10 sequential dose cohorts. Based on pharmacokinetic and pharmacodynamic data from the early dose cohorts in the trial, we adjusted the intravenous infusion of bentracimab to identify the optimal dose and dosing regimen for future trials and for the target patient populations. The initial three cohorts of subjects were dosed with 30-minute intravenous infusions of bentracimab alone in order to assess pharmacokinetics and safety. Subsequent cohorts were pre-dosed with the standard clinical regimen of ticagrelor for two days prior to administration of bentracimab to enable direct assessment of reversal of ticagrelor's inhibition of platelet aggregation using platelet function assays. There were no bentracimab-related AEs or SAEs in any of the dose cohorts.

In cohorts 5 and 6, which were the first cohorts in which potentially pharmacodynamically active doses of bentracimab were administered, we saw immediate and complete reversal of ticagrelor's antiplatelet activity based upon restoration of platelet function. In 11 out of 12 subjects, platelet function was restored at the first measured time point at the end of the 30-minute infusion. The duration of reversal varied from approximately one to four hours depending upon the dose level and subject, with longer duration at higher doses. In cohort 7, we modified the dosing regimen to deliver a total dose of 18 g, with 3 g delivered in the first five minutes of infusion, followed by 15 g delivered at a constant rate over an additional seven hours and 55 minutes. In cohort 7, we observed that all subjects achieved complete and sustained restoration of platelet function within two hours after the start of infusion. The duration of reversal in cohort 7 lasted approximately 16 hours from the start of the infusion as measured by restoration of platelet activity.

In cohorts 8, 9 and 10, the dosing regimen of bentracimab was further refined to achieve both a more rapid onset of reversal and a longer duration of reversal compared to earlier cohorts. We administered a total dose of 18 g, with the initial 6 g delivered as a bolus in cohorts 8, 9 and 10. The remaining 12 g was administered after the initial bolus for an additional 12 to 16 hours in cohorts 8, 9 and 10. In each of these cohorts, we observed both immediate and complete reversal within the first five minutes following initiation of infusion and a sustained duration of reversal of over 20 hours. We intend to further evaluate the dose and dosing regimens observed in these cohorts in future clinical trials.

Future Clinical Development Plans

The FDA granted Breakthrough Therapy designation for bentracimab in April 2019. The EMA granted bentracimab PRIME designation in February 2020, and the CHMP has generally agreed with our clinical development plan. Based on feedback from the FDA, we intend to submit a BLA for potential accelerated approval based on an interim analysis of the first approximately 100 patients treated in our REVERSE-IT trial, targeting that approximately one half of patients enrolled have uncontrolled major or life-threatening bleeding and approximately one half require urgent surgery or an invasive procedure. To support full approval for patients with uncontrolled major or life-threatening bleeding or requiring urgent surgery or an invasive procedure, and consistent with the recommendation of the FDA, we plan to enroll 200 total patients in the REVERSE-IT trial. After we submit our BLA with data from the first 100 patients, we intend to complete the REVERSE-IT

trial and establish a post-approval registry in accordance with FDA requirements. We expect to complete enrollment of the first 100 patients in the REVERSE-IT trial in mid-2021, and are targeting to submit our BLA for bentracimab in mid-2022, although those timelines could be impacted by the continued scope and duration of the COVID-19 pandemic.

Pemziviptadil for the Treatment of Pulmonary Arterial Hypertension

We are developing our second product candidate, pemziviptadil, as a once-weekly novel treatment for PAH. Pemziviptadil is based on our proprietary ELP half-life extension technology. We are currently conducting a Phase 2b clinical trial in PAH patients to assess the safety, tolerability and efficacy of pemziviptadil. We have received two orphan drug designations for pemziviptadil from the FDA: one for the treatment of PAH and a second for cardiomyopathy associated with DMD. In February 2018, we received Small Business Innovation Research, or SBIR, grants from the National Institutes of Health in an aggregate amount of $2.8 million to support the clinical development of pemziviptadil for the treatment of PAH for the period from February 17, 2018 to July 31, 2020. In connection with the SBIR grants, the United States government will receive a non-exclusive, royalty-free license to use any technology we develop under such grants. We have received all $2.8 million in funding available under the SBIR grants. For the years ended December 31, 2020 and 2019, we recognized $0.3 million and $1.8 million, respectively, of grant revenue under the SBIR grants.

Background on PAH

PAH is a progressive and life-threatening orphan disease with no known cure. Common symptoms, which worsen as the disease progresses, include shortness of breath, fatigue, angina, fainting, light headedness and abdominal distension. The disease is caused by abnormal constriction and adverse remodeling of the arteries and is characterized by high blood pressure in the pulmonary arteries, the blood vessels leading from the heart to the lungs. This pressure restricts blood circulation through the lungs resulting in poor oxygenation, abnormal strain on the heart's right ventricle and underfilling of the left ventricle. Over time, the remodeling worsens as inflammatory cells are recruited. This leads to tissue scarring and fibrosis, which results in severe restriction of blood flow, increasing the risk of developing life-threatening blood clots, heart failure and premature death.

The clinical severity of PAH is classified according to a system originally developed for heart failure by the New York Heart Association and then modified by the World Health Organization for patients with PAH, ranging from functional class I (no symptoms) through functional class IV (severe symptoms). Most standard-of-care therapy is initiated in patients who have progressed to class II or beyond.

According to the Pulmonary Hypertension Association, there are approximately 30,000 patients diagnosed with PAH in the United States. There are several approved therapies for PAH, and patients initially start treatment with a combination of two oral therapies. While advances in the treatment of PAH over the last two decades have markedly improved median survival from 2.8 years to approximately 9 years after diagnosis, PAH patients still face significant burdens from their disease and premature death. We estimate, based on publicly disclosed data, that the value of the global PAH market exceeded $6.0 billion in 2019 and it is expected to reach nearly $10.0 billion by the end of 2027.

Limitations of Current Therapies for PAH

There is currently no cure for PAH. The three main classes of currently approved drugs for the treatment of PAH are all systemic vasodilators that directly modulate vasoconstrictive or vasodilatory pathways. These currently approved therapies for PAH focus on three distinct molecular pathways: the endothelin pathway, the nitric oxide pathway and the prostacyclin pathway. The classes of drugs that target these three pathways are:

- ***Endothelin Receptor Antagonists.*** Endothelin receptor antagonists work by blocking the action of endothelin-1, a potent vasoconstrictor, thereby increasing blood flow to the lungs. These drugs, which are delivered orally, include bosentan and macitentan, marketed by Actelion as Tracleer and Opsumit, and ambisentan, marketed by Gilead as Letairis.
- ***Nitric Oxide Pathway Modulators.*** Nitric oxide is a naturally occurring molecule that is widely recognized as important in a number of biological processes. Nitric oxide causes blood vessels to relax and widen, resulting in an increase in blood flow. Oral drugs such as sildenafil, marketed by Pfizer as Revatio, and tadalafil, marketed by United Therapeutics as Adcirca, are phosphodiesterase type 5 inhibitors that work by enhancing the activity of naturally occurring nitric oxide.
- ***Prostacyclin Analogues and IP Prostacyclin Receptor Agonists.*** Patients with PAH have been shown to have reduced levels of prostacyclin, a naturally occurring substance that relaxes the pulmonary blood vessels, prevents platelet aggregation and inhibits the proliferation of smooth muscle cells in the

pulmonary vessels. Prostacyclin analogues and IP prostacyclin receptor agonists, such as iloprost, treprostinil and selexipag, marketed by Bayer and Actelion as Ventavis, United Therapeutics as Remodulin and Actelion as Uptravi, respectively, mimic the effects of prostacyclin and are approved therapies for PAH.

These drugs have been shown to improve exercise capacity, quality of life, pulmonary arterial pressure and short-term survival in PAH patients and suggest enhanced long-term survival based on observational studies. However, none of the current treatments is curative, and long-term prognosis remains poor. These therapies have a singular approach to treating PAH by modulating the vasoconstrictive or vasodilatory pathways but have limited ability to address other disease processes such as inflammation, cell proliferation, fibrosis and vascular remodeling. Furthermore, these drugs can cause hypotension, which can cause fainting and dizziness and can be life-threatening. As the disease progresses, additional vasodilator therapies are typically added to existing therapies rather than replacing drugs that are no longer providing sufficient benefit.

Our Solution: Pemziviptadil

Pemziviptadil, a novel, subcutaneously-injected VIP analogue, is a recombinant fusion protein composed of VIP and our proprietary ELP technology. Based on the pharmacokinetic profile of pemziviptadil observed in our clinical trials, the fusion of VIP to ELP results in both a longer circulating half-life and a prolonged absorption profile, potentially enabling once-weekly dosing. We believe that, in addition to vasodilation, pemziviptadil may suppress the adverse remodeling of blood vessels and increase cardiac contractility and relaxation. Pemziviptadil has been administered to more than 80 patients with hypertension or a history of cardiac disease in three Phase 1/2 clinical trials conducted in the United States with no SAEs considered to be drug-related and resulting in study drug discontinuation, to date.

Pemziviptadil Background

VIP is a peptide hormone produced in many tissues throughout the body. Native VIP exerts its function in the body by binding to two distinct receptors: vasoactive intestinal peptide receptor 1, or VPAC1, and vasoactive intestinal peptide receptor 2, or VPAC2. As is the case for many other peptide hormones, the body uses VIP for distinct purposes in different locations. VPAC1 is found predominantly in the gastrointestinal tract, while VPAC2 is found predominantly in the myocardial wall and pulmonary arteries. VIP plays a key role in the relaxation of smooth muscles, which in turn leads to the dilation of blood vessels and to the lowering of arterial blood pressure. VIP also inhibits airway and pulmonary vascular smooth muscle cell proliferation and has broad anti-inflammatory properties, in addition to neutralizing a variety of pulmonary vasoconstrictors, including endothelin.

We designed pemziviptadil using our ELP technology to harness the positive therapeutic effects of native VIP while addressing the drawbacks that make native VIP inappropriate for use as a direct therapy. Native VIP is rapidly degraded, and, when injected into the body, is eliminated within minutes, limiting its therapeutic effect. High levels of native VIP also result in severe gastrointestinal problems due to VPAC1 activation. We have used our ELP technology to extend the half-life of VIP in pemziviptadil to approximately 60 hours. In addition, we designed pemziviptadil to be active predominantly on VPAC2 rather than VPAC1 in order to preferentially affect the lung and cardiac tissue and reduce the potential for gastrointestinal side effects associated with VPAC1 activation.

Clinical Development of Pemziviptadil

We have completed two clinical trials of subcutaneously-injected pemziviptadil. In these trials, pemziviptadil was observed to be well tolerated, with no SAEs considered to be drug-related and resulting in study drug discontinuation. In both trials, we observed that patients receiving pemziviptadil experienced reductions in blood pressure that were sustained for at least one week, with no reported episodes of symptomatic hypotension.

Pemziviptadil Phase 2b Clinical Trial

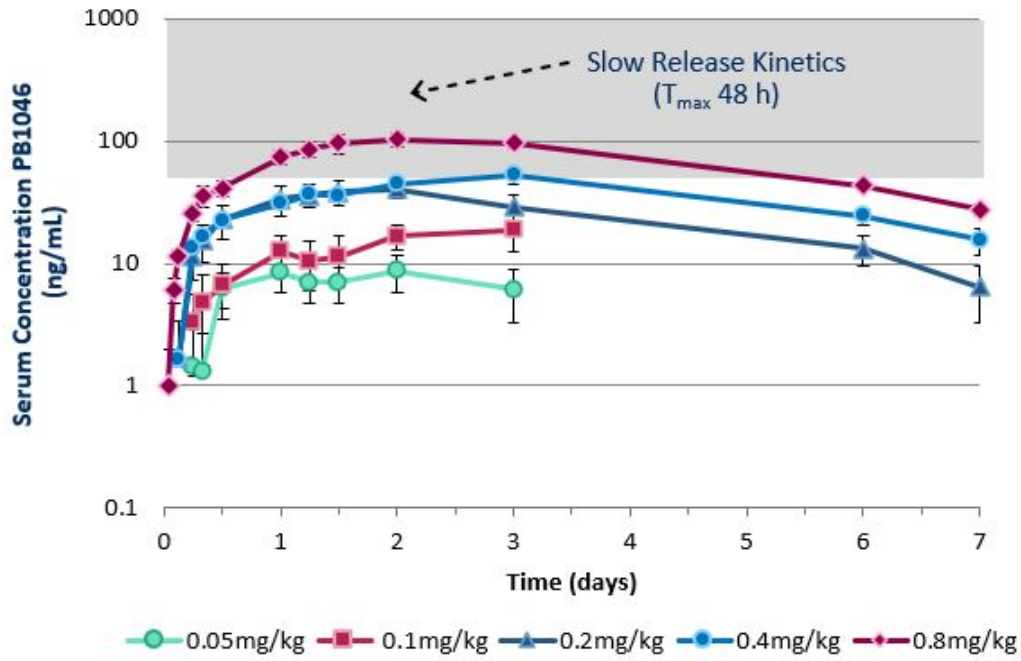
We are conducting a randomized, double-blinded, controlled Phase 2b trial in approximately 60 patients with PAH who are New York Heart Association functional class II or III, with an open-label extension. In this trial, patients receive weekly subcutaneous injections of pemziviptadil, in addition to their oral standard-of-care medications, for 16 weeks. These patients initially receive a dose of 0.2 mg/kg of pemziviptadil, to be escalated and ultimately increased to a maximum dose of 2.0 mg/kg, as tolerated. Because in earlier clinical trials we have observed an association between pemziviptadil dosing and injection-site erythema, in lieu of a completely inactive placebo we instead use a blinded control that has a very low dose of pemziviptadil that is below a level likely to have therapeutic benefit, but still produces local vasodilation at the injection site in most subjects. The primary endpoint is the change in pulmonary vascular resistance as measured by invasive right heart

catheterization. Secondary endpoints include six minute walk distance, respiratory function and biomarkers for cardiac function. Safety endpoints include incidence and severity of AEs and immunogenicity. Six minute walk distance is an important clinical endpoint that the FDA has previously used as the basis for approval of other PAH drugs. We are targeting to report the top-line results of this trial in the second half of 2021, although that timeline could be impacted by the continued scope and duration of the COVID-19 pandemic.

Phase 1 Single Ascending Dose Clinical Trial

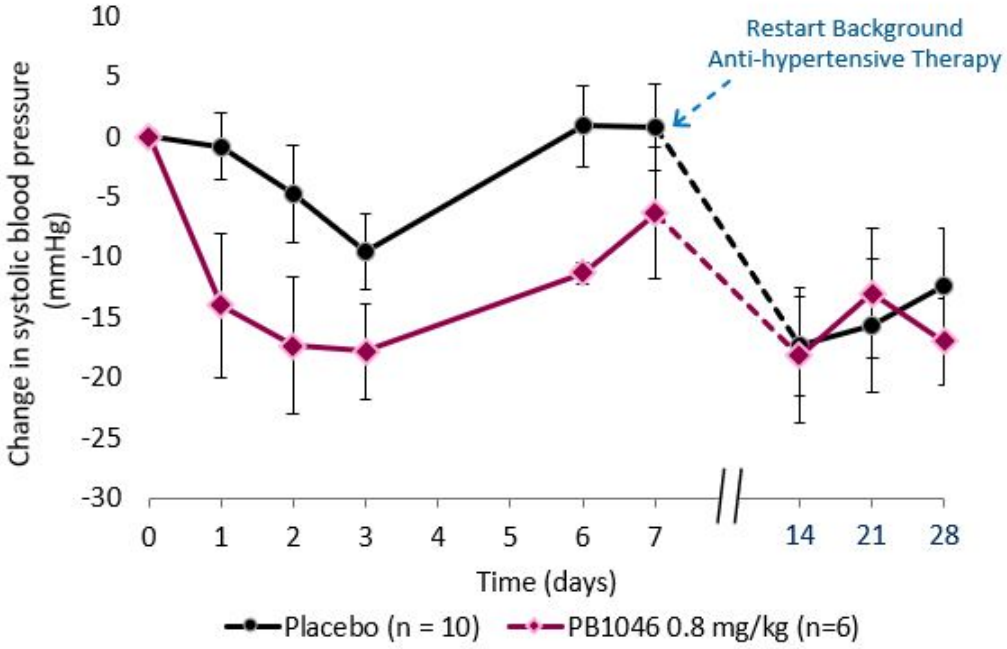
We completed a single ascending dose Phase 1 clinical trial of subcutaneously injected pemziviptadil in 30 patients with hypertension to assess the safety and pharmacokinetics of pemziviptadil and to demonstrate early proof of concept. In this clinical trial, the patients stopped taking their standard-of-care anti-hypertensive medications for 14 days before receiving either placebo or a single ascending dose of pemziviptadil of between 0.05 mg/kg and 0.8 mg/kg. Consistent with our expectation for slow release of ELP fusion proteins, the half-life of pemziviptadil was approximately 60 hours and serum levels of pemziviptadil exhibited a prolonged pharmacokinetic profile extending to at least seven days following a single subcutaneous dose, as illustrated below. This is in contrast to the pharmacokinetics of native VIP in which serum levels of VIP disappear within minutes. We believe these results support once-weekly subcutaneous dosing of pemziviptadil.

Pharmacokinetics of single subcutaneous doses of pemziviptadil in a Phase 1 dose escalation trial



The pharmacodynamic activity of pemziviptadil was assessed by measurements of changes in blood pressure. In the highest dose cohort, we observed that systolic and diastolic blood pressure in patients receiving pemziviptadil were reduced within one day and remained below levels seen in placebo-treated patients for seven days, as illustrated below. At seven days, all patients resumed their standard hypertension medications and subsequent blood pressures, and the magnitude of reduction in blood pressure compared to baseline was similar whether they had received pemziviptadil or placebo.

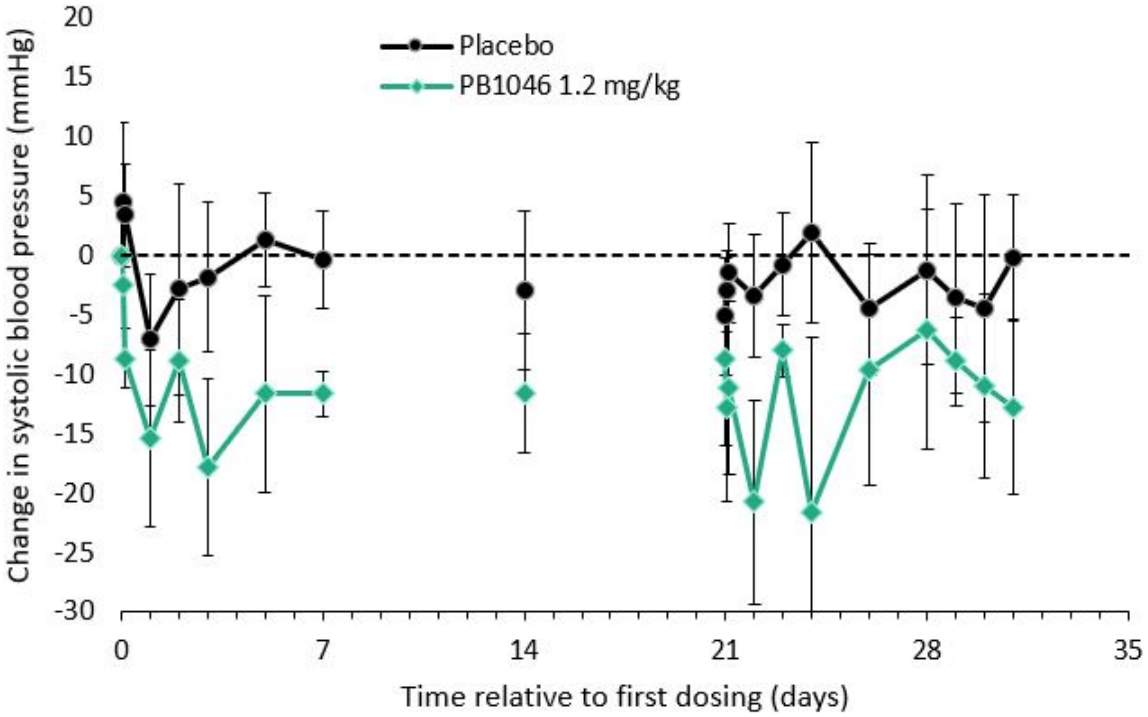
Mean change in systolic blood pressure in a Phase 1 trial following single subcutaneous dose of pemziviptadil



Phase 1b/2a Multiple Ascending Dose Clinical Trial

We conducted a double-blinded, multiple ascending dose Phase 1b/2a trial in 29 patients with heart failure with reduced ejection fraction, or HFrEF, in order to assess the safety and long-acting pharmacokinetic and pharmacodynamic activity of subcutaneously injected pemziviptadil in patients with cardiovascular disease. In HFrEF, the heart muscle is not able to contract adequately and therefore expels less oxygen-rich blood into the body. In this clinical trial, patients remained on their standard-of-care heart failure medications and received either weekly placebo or weekly doses of pemziviptadil of between 0.2 mg/kg and 1.2 mg/kg for four weeks. This clinical trial reproduced the safety, pharmacokinetic and pharmacodynamic observations of the single-dose trial, and we observed that once-weekly dosing was well tolerated. No drug-related SAEs were reported, and there were no reported instances of hypotension, excluding mild orthostatic hypotension in four subjects, which did not appear to be dose related. Of the 22 subjects who received active study drug, all experienced injection-site erythema reaching severe toxicity due to the size of the erythema, and three subjects discontinued treatment due to the erythema. We observed that patients in the highest dose cohort had a statistically significant reduction in blood pressure compared to placebo that was sustained throughout the dosing period, with p-value of 0.043, as illustrated below. A result is considered to be statistically significant when the probability of the result occurring by random chance, rather than from the efficacy of the treatment, is sufficiently low. The conventional method for determining the statistical significance of a result is known as the “p-value,” which represents the probability that random chance caused the result (for example, a p-value = 0.01 means that there is a 1% probability that the difference between the control group and the treatment group is purely due to random chance). Generally, a p-value less than 0.05 is considered statistically significant.

Mean change in systolic blood pressure in a Phase 1b/2a trial following four weekly subcutaneous doses of pemziviptadil



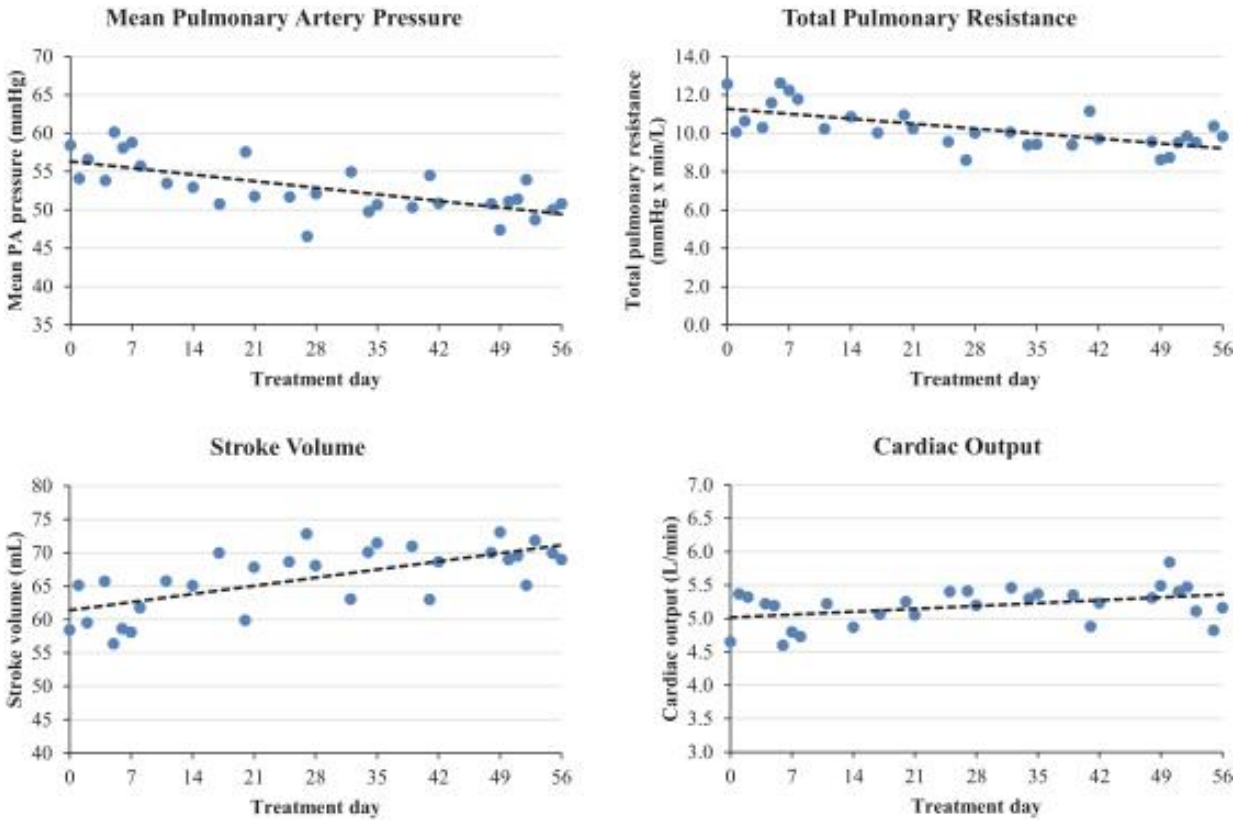
Based on the results of this clinical trial, and an assessment of a number of clinical and commercial factors, we determined that our initial indication for pemziviptadil would be PAH.

Phase 1b/2a CardioMEMS Pilot Clinical Trial

Prior to launching a large Phase 2b trial in patients with PAH, the FDA requested that we explore the safety and hemodynamics of pemziviptadil in patients with PAH. To achieve this objective, we initiated a pilot Phase 1b/2a clinical trial in a small population of PAH patients who had an implanted CardioMEMS device. The patients enrolled in this trial were difficult-to-treat patients with long histories of PAH who were no longer responding to their current therapies. These patients initially received a dose of 0.2 mg/kg of pemziviptadil, which was escalated weekly as tolerated and could be increased to a maximum dose of 2.2 mg/kg, while remaining on their existing therapies.

In the first two patients dosed in this clinical trial, we observed changes in parameters that are important to PAH patients. Pulmonary arterial pressure and pulmonary resistance decreased over time while cardiac stroke volume and overall cardiac output increased without any reflex tachycardia, and six-minute walk test distances, or 6MWTD, either improved or demonstrated no clinically meaningful deterioration. Hemodynamic results for one of the patients in this trial are illustrated below. The 6MWTD results from this patient reflected an improvement from 468 meters to 546 meters (+78m, +17% from baseline) after 18 months on therapy. The hemodynamic results from the second patient were generally consistent with the results from the first patient. The 6MWTD results from the second patient reflected no clinically meaningful deterioration after 6 months on therapy (+16m, +7% change from baseline). These observations are consistent with our expectations for a VIP-based therapy. During the eight-week trial, these patients had continued hemodynamic improvements over a period of 60 days, which we believe suggest that, in addition to its vasodilatory activity, pemziviptadil may also have more long-term effects on blood vessel and cardiac remodeling. These patients also opted into a trial protocol extension, which allowed them to remain on therapy for approximately 18 months and six months, respectively.

Representative CardioMEMS data from one PAH patient receiving weekly doses of pemziviptadil



In subsequent discussions with the FDA, the safety profile of our Phase 1b/2a clinical trial and the available data from this pilot clinical trial were reviewed, and the FDA determined that our data were sufficient to enable initiation of a Phase 2b clinical trial. Accordingly, we do not intend to enroll additional patients in this pilot clinical trial.

Safety Overview from Clinical Trials of Pemziviptadil

There were no SAEs considered to be drug-related and resulting in study drug discontinuation reported for any of the patients who have received pemziviptadil. When pemziviptadil was administered subcutaneously, it was almost always associated with a mild- to moderate- injection-site erythema, or patch of redness, which on average appeared at about 12 hours after injection. The injection-site erythema was not judged by the investigator to be an allergic-type reaction; rather, in the investigator's view, it was likely to be associated with the activity of VIP binding to receptors in the skin, resulting in local vasodilation. Additionally, 70% of patients receiving a subcutaneous injection of pemziviptadil experienced mild pain or tenderness at the injection site, which occurred hours to days after injection and on average lasted about one week. One-third of the patients also experienced mild pruritus, or itching, at the site of injection. We believe that these events are primarily due to the fused VIP peptide since similar events were not observed in clinical trials of other constructs that contain the ELP domain. None of the injection site reactions were judged to be serious. We observed a similar tolerability profile in the Phase 1 clinical trial of pemziviptadil. Notably, there were no events of symptomatic hypotension related to pemziviptadil in any of the subjects who have received pemziviptadil.

Preclinical Studies

Published independent research indicates that patients with PAH have both reduced levels of VIP in the lung and in circulation as well as increased levels of VPAC2 receptors in lung tissue. Mice bred to be VIP-deficient spontaneously express symptoms of moderately severe PAH. Repeated treatment of these mice with VIP corrected the key characteristics of the disease including right heart dysfunction, vascular remodeling and lung inflammation. In the monocrotaline-induced PAH rat model, an experimental model of PAH, VIP was active in preventing, and partially reversing, the symptoms of PAH. Combination therapy with VIP and the endothelin receptor antagonist bosentan was shown to be more active than either drug

alone. Furthermore, in multiple preclinical studies we have demonstrated the benefits of pemziviptadil in cardiomyopathies, due to its ability to induce heart contractility and relaxation effects without an increase in myocardial oxygen demand.

Potential Applications of Pemziviptadil in Other Indications

The biological activities associated with VIP have the potential to provide therapeutic benefit to patients with other diseases. We believe that pemziviptadil provides a mechanism to bring these VIP-based therapies forward in the following indications:

- ***DMD-associated Cardiomyopathy***. Cardiac dysfunction is a very common manifestation of DMD and a common cause of death for individuals with this condition. The ability of pemziviptadil to increase contractibility of cardiac muscles presents the possibility that it could provide therapeutic benefit to these patients. We observed that pemziviptadil slowed deterioration in cardiac function and preserved skeletal muscle function in a mouse model of DMD. In addition to direct effects on cardiac function, we believe decreased fibrosis also contributed to the positive effects of pemziviptadil on both cardiac and skeletal muscle in this model. The FDA has granted orphan drug designation for pemziviptadil for the treatment of cardiomyopathy associated with DMD.
- ***Cystic Fibrosis***. VIP has been shown to stimulate the processing of the cystic fibrosis transmembrane regulator, or CFTR, the protein defective in patients with cystic fibrosis, or CF. In mice lacking the gene for VIP, CFTR is not located at the cell surface, where it is required to function properly, but accumulates within the cell. These mice have lung abnormalities that resemble CF and treatment with VIP peptide restored CFTR to the cell surface and corrected the lung tissue abnormalities. Treatment of human epithelial cells containing the most common CFTR mutation found in CF patients (F508del) with pemziviptadil *in vitro* has been observed to increase CFTR activity, providing further support that pemziviptadil may have potential as a treatment for patients with CF.

PB6440 for Treatment-Resistant Hypertension

PB6440 is a selective aldosterone synthase inhibitor that we are developing as an orally administered treatment for resistant hypertension. The mineralocorticoid hormone aldosterone is a critical regulator of fluid and electrolyte balance in the body and, as such, can play an important role in the development of high blood pressure or hypertension. Elevated aldosterone levels are associated with resistant hypertension, congestive heart failure and chronic kidney disease. Agents that block the action of mineralocorticoids at the receptor level, such as spironolactone, have been shown to lower blood pressure, including in patients with resistant hypertension. However, use of these agents is limited by adverse side effects. Inhibition of the production of aldosterone through inhibition of the enzyme responsible for its synthesis, aldosterone synthase (CYP11B2), is an alternative approach to treatment of hypertension. However, development of aldosterone synthase inhibitors is challenging because of a closely-related enzyme, steroid 11β-hydroxylase (CYP11B1), which many potential compounds also inhibit. In preclinical studies, PB6440 was observed to be a highly potent and selective inhibitor of aldosterone synthase and demonstrated a dose-dependent aldosterone reduction without a significant increase in 11-deoxycorticosterone or deoxycortisol in both rodent and primate models. The oral bioavailability and pharmacokinetic profiles appear suitable for once-daily oral dosing in humans. We currently plan to initiate clinical development of PB6440 pending the completion of nonclinical IND-enabling studies planned for 2021, which are expected to be followed by an IND filing and a first-in-human trial in 2022.

ELP Technology

Our proprietary ELP technology is based on recombinant biopolymers called ELPs, which comprise individual subunits or building blocks derived from a five-amino acid repeat motif found in the human protein elastin. This five-amino acid motif is repeated multiple times to form the ELP biopolymer. We produce our ELP-based products by engineering *E. coli* to produce a single protein comprising the active peptide or protein fused to the ELP biopolymer. This molecule is active as a fusion protein and does not require cleavage or release of the peptide. ELP fusion proteins are produced in the soluble fraction of *E. coli*, which allows for ease of scale-up and purification.

Fusion to ELPs significantly improves the stability of peptides and proteins and enables use of natural or minimally altered peptide sequences. We believe these fusion proteins retain similar potency to the native molecule while being protected from degradation by enzymes in circulation. Additionally, we have observed that the fusion protein maintains the solubility and long half-life of the ELP, in many cases allowing for long-term liquid stability, which is important for injectable products.

ELP fusion proteins can undergo a reversible phase transition, in which ELP fusion proteins aggregate and form a sustained-release depot under the skin. This phase transition is driven by changes in temperature. At lower temperatures ELP fusion proteins are completely soluble, while at warmer temperatures the ELP fusion proteins are in a gel-like state. This allows the ELP fusion proteins to be easily handled and administered subcutaneously using standard, fine gauge needles and syringes. Once the ELP fusion protein is exposed to body heat, it forms a drug depot that slowly releases soluble ELP fusion protein into circulation. By modifying the amino acid sequence of the individual subunits and by varying its overall length, we can engineer our ELP fusion proteins to be released on timescales extending to a week or longer.

Product candidates based on our ELP technology, including prior product candidates for which we have ceased development in order to focus on the development of therapies for cardiopulmonary diseases, have been evaluated in over 500 patients with no known SAEs considered to be drug-related and resulting in study drug discontinuation.

Preclinical ELP Programs

We continue to invest in applying our ELP technology to the development of novel product candidates. Our focus is on peptides and proteins that are scientifically or clinically validated but where a suboptimal half-life, stability and delivery limit their potential therapeutic applications.

Our more advanced ELP preclinical programs include:

- ***Glucagon-like peptide-2***. Glucagon-like peptide-2, or GLP-2, stimulates growth of intestinal villi, increasing their ability to absorb nutrients. GLP-2 is a potential treatment for patients with short bowel syndrome, Crohn's disease or mucositis in patients undergoing cancer treatment. Teduglutide, currently marketed under the brand name Gattex, is an FDA-approved therapy based on GLP-2 that requires daily injections. In animal models, our GLP-2-ELP product candidate provided sustained levels of GLP-2, resulting in greater efficacy than teduglutide with less frequent dosing.
- ***C-type natriuretic peptide***. C-type natriuretic peptide, or CNP, is a regulator of bone growth and can rescue defects in fibroblast growth factor 3 that cause achondroplasia resulting in dwarfism. Native CNP has a half-life of less than three minutes, limiting its use as a direct therapeutic. We are developing our CNP-ELP product candidate to deliver therapeutic levels of CNP with once weekly subcutaneous injections. In a mouse model, we observed a demonstrated effect on linear growth when our CNP-ELP product candidate was injected once every four days.

License, Co-Development and Other Agreements

MedImmune Limited License Agreement

In November 2017, we entered into an exclusive license agreement with MedImmune, a wholly-owned subsidiary of AstraZeneca, or the MedImmune License. Pursuant to the MedImmune License, MedImmune granted us an exclusive, worldwide license under certain patent rights owned or controlled by MedImmune to develop and commercialize any products covered by the MedImmune License, or the MedImmune licensed products, for the treatment, palliation, diagnosis or prevention of any human disorder or condition. The in-licensed patent rights are generally directed to antibodies that bind to ticagrelor and methods of use and include two issued patents in the United States, three pending patent applications in the United States and 13 pending foreign applications. The last patent is expected to expire in 2036 without extension. We have the right to sublicense the licensed technology to third parties subject to certain conditions as specified in the MedImmune License. Under the MedImmune License, we grant to MedImmune a worldwide, non-exclusive, royalty-free, irrevocable license and right of reference solely to exploit any drug product containing ticagrelor or any invention, discovery, development or modification with respect to any drug product containing ticagrelor.

Under the terms of the MedImmune License, we have paid or are required to pay:

- an upfront fee of $0.1 million;
- quarterly fees relating to technical services provided by MedImmune;
- up to $18.0 million upon the achievement of certain clinical and regulatory milestones;
- up to $50.0 million upon the achievement of certain commercial milestones; and
- mid-single digit to low-teen royalty percentages on net sales of MedImmune licensed products, subject to reduction in specified circumstances.

From the inception of the MedImmune License through December 31, 2020, we have paid $3.6 million under the MedImmune License, related to third-party product storage costs and a milestone payment.

The MedImmune License requires us to use commercially reasonable efforts to develop, obtain and maintain regulatory approval for and commercialize the MedImmune licensed products throughout the term of the MedImmune License. We have the first right, but not the obligation, to control prosecution of the in-licensed patents. In addition, our rights under the MedImmune License are not assignable without the prior written consent of MedImmune, except to a third-party acquirer by our merger or sale of our stock or assets or to an affiliate of our company.

Unless earlier terminated, the MedImmune License automatically expires on the date on which we no longer owe any royalty payments to MedImmune under the MedImmune License, which date will occur on the later of (1) the tenth anniversary of the first commercial sale of the MedImmune licensed products, (2) the expiration of the last in-licensed patent in 2036 and (3) the expiration of regulatory exclusivity under the MedImmune License. The MedImmune License may be terminated prior to its expiration:

- by mutual written consent of us and MedImmune;
- by either party upon the other party's material breach of the MedImmune License that is not cured within the specified cure period based on the nature of such breach;
- by either party in the event of either party's bankruptcy, insolvency or certain similar occurrences;
- by MedImmune if we bring any action or proceeding challenging the validity or enforceability of any of the licensed patents;
- by us, under specified circumstances, if we believe in good faith that there is (1) an issue with respect to the safety or efficacy of bentracimab or any MedImmune licensed product containing bentracimab or (2) an issue with respect to the commercial viability of any MedImmune licensed products, in each case subject to dispute resolution by an independent expert; and
- by us, with respect to a particular country or region, if any product containing ticagrelor is withdrawn by a regulatory authority in such country or region.

Upon termination of the MedImmune License, we grant to MedImmune an exclusive, royalty-free, sublicensable license under our patent rights and know-how to use, sell, have sold, offer for sale, develop, make, have made, manufacture, commercialize, have used, import, export, transport, distribute, promote, market or otherwise dispose certain compounds or products covered by the MedImmune License.

In January 2020, in connection with our entering the SFJ Agreement, we entered into an amendment to the exclusive license agreement pursuant to which MedImmune consented to a potential assignment of the MedImmune License and transfer of our business related to bentracimab to SFJ in the event of the occurrence of certain program transfer events, should they ever occur.

Co-Development Agreement for Bentracimab with SFJ Pharmaceuticals

In January 2020, we entered into the SFJ Agreement, pursuant to which SFJ provides us funding to support the global development of bentracimab as a reversal agent for the antiplatelet drug ticagrelor in patients with uncontrolled major or life-threatening bleeding or requiring urgent surgery or an invasive procedure. Under the SFJ Agreement, SFJ has agreed to pay us up to $120.0 million to support the clinical development of bentracimab. From the inception of the SFJ Agreement through December 31, 2020, SFJ has provided funding and paid for amounts on our behalf in the aggregate amount of $47.1 million. In addition, we expect that SFJ will fund or reimburse an additional $42.9 million of clinical trial costs and other expenses pursuant to the SFJ Agreement. SFJ will also provide up to an additional $30.0 million upon the achievement of specified milestones with respect to our clinical development of bentracimab.

During the term of the SFJ Agreement, we will have primary responsibility for clinical development and regulatory activities for bentracimab in the United States and the European Union, while SFJ will have primary responsibility for clinical development and regulatory activities for bentracimab in China and Japan and will provide clinical trial operational support in the European Union. We have agreed to use commercially reasonable efforts to conduct and complete our REVERSE-IT trial of bentracimab and to file a BLA or its foreign equivalent within specified timelines with each of the FDA and the EMA. We have formed a joint steering committee with SFJ to oversee and manage the collaboration, including our REVERSE-IT program and the regulatory process.

Under the terms of the SFJ Agreement, following the FDA approval of a BLA for bentracimab, we will pay SFJ an initial payment of $5.0 million and an additional $325.0 million in the aggregate in seven additional annual payments. If the EMA, or the national regulatory authority in certain European countries, authorizes a marketing approval for bentracimab, we will pay SFJ an initial payment of $5.0 million and an additional $205.0 million in the aggregate in seven additional annual payments. If either the Pharmaceuticals and Medical Devices Agency of Japan, or the PMDA, or the National Medical Products Administration of China, or the NMPA, approves a marketing application for bentracimab, we will pay SFJ an initial payment of $1.0 million and then an additional $59.0 million in the aggregate in eight additional annual payments.

Within 120 days following approval of a BLA, or its equivalent, for bentracimab in one of the jurisdictions described above, we have the right, at our option, to make a one-time cash payment to SFJ to buy out all or a portion of the future unpaid approval payments for such jurisdiction (i.e., the U.S. Approval Payments, EU Approval Payments or Japan/China Approval Payments, as applicable) for a price reflecting a mid-single-digit discount rate. Within 120 days following a change of control of our company, we or our successor have the right, at its option, to make a one-time cash payment to SFJ to buy out all or a portion of the future unpaid approval payments in any of the jurisdictions in which a BLA, or its equivalent, for bentracimab was approved prior to the change of control for a price reflecting a mid-single-digit discount rate, provided that SFJ has not previously assigned the right to receive such payments to a third party, in which event we or our successor shall not have such right.

Under the SFJ Agreement, we granted SFJ a security interest in all of the assets we own or control that are necessary for the manufacture, use or sale of bentracimab, or bentracimab Intellectual Property. In connection with the grant of the security interest, we agreed to certain affirmative and negative covenants, including restrictions on our ability to pay dividends, incur additional debt or enter into licensing transactions with respect to the bentracimab Intellectual Property. In addition, we agreed that the security interest granted to SFJ will be a first-priority security interest, subject only to the lien of SVB for our existing indebtedness to SVB.

Upon execution of the SFJ Agreement, we issued to SFJ a ten-year warrant exercisable for 2,200,000 shares of our common stock at an exercise price per share of $6.50. The warrant is exercisable as follows: (i) 1,100,000 shares may be exercised at any time after the effective date of the SFJ Agreement, provided that SFJ may not sell such exercised shares until one year after such effective date, and (ii) the remaining 1,100,000 shares may be exercised at any time at SFJ’s election if the results of our REVERSE-IT trial meet the interim primary endpoint as set forth in the REVERSE-IT trial protocol.

In the event that (i) we fail to pay any amounts payable to SFJ under the SFJ Agreement within a specified time period, (ii) we are in default of our obligations, subject to certain exclusions, under the MedImmune License, or (iii) either (a) we determine it is probable that we will be unable to meet our obligations as they become due within one year after the date that our financial statements for the then-current quarter are issued, or available to be issued or (b) a “going concern” footnote is included in any of our financial statements, and, in either case ((a) or (b)), we fail to remedy such going concern condition as specified in the SFJ Agreement, SFJ may elect to have our business related to bentracimab transferred to SFJ. We refer to such events (i), (ii) or (iii) as the Potential Program Transfer Events. We have multiple quarters in which to remedy the going concern condition, including by restructuring our costs and operations, raising additional capital in financing or strategic transactions or accepting additional financing from SFJ on the same terms as their original commitment (which additional financing they have the option, but not obligation, to provide). If our business related to bentracimab is transferred to SFJ, we will not share in any revenues from the commercialization of bentracimab until SFJ has received a 300% return on its investment in bentracimab, after which we will be entitled to a mid-single-digit royalty on net sales of bentracimab in the United States and certain European countries, and after SFJ has received an aggregate 500% return on its investment in bentracimab, we will be entitled to a mid-single-digit royalty on net sales of bentracimab in the rest of the world. See Risk Factors—"The auditor's opinion on our audited financial statements for the fiscal year ended December 31, 2020 included in this Annual Report on Form 10-K contains an explanatory paragraph relating to our ability to continue as a going concern. Further, under the SFJ Agreement, SFJ may elect to have our business related to bentracimab transferred to SFJ if we do not remedy such going concern condition within the periods specified in the agreement and our ability to share in any revenues from the commercialization of bentracimab will be materially and adversely affected."

The SFJ Agreement expires upon the payment of all approval payments owing to SFJ, unless earlier terminated. The SFJ Agreement may be terminated by us at will at any time after SFJ has paid or incurred a total of $60.0 million of bentracimab development costs and before receipt of approval of any BLA (or its equivalent) for bentracimab from the FDA, the EMA, the PMDA or the NMPA. SFJ may terminate the SFJ Agreement (i) upon the occurrence of a material adverse event, as defined in the SFJ Agreement, (ii) upon a change of control of us, (iii) if (a) we are enjoined from further developing or commercializing bentracimab in any of the United States, certain European countries, China, Japan or Hong Kong or (b) the future value of bentracimab is materially adversely affected due to (1) certain third-party patents that would be infringed by the manufacture, use, sale, offer for sale or import of bentracimab in any of the United States, certain European countries or China, Japan or Hong Kong or (2) invalidity or unenforceability of all patent rights controlled by us covering bentracimab as a reversal agent for the antiplatelet drug ticagrelor in patients with uncontrolled major or life-threatening bleeding or requiring urgent

surgery or an invasive procedure in any of the United States, certain European countries, Japan, China or Hong Kong (we refer to each of (a) and (b) as an Adverse Patent Impact), if we do not cure the Adverse Patent Impact within six months of notice from SFJ, or (iv) if SFJ disagrees with certain decisions made by us as part of the joint steering committee. The SFJ Agreement may be terminated by either party (i) upon a material breach of the SFJ Agreement by the other party, (ii) if bentracimab fails to receive regulatory approval from at least one of the FDA, the EMA, the PMDA or the NMPA after completion of the REVERSE-IT trial of bentracimab, submission of BLAs, or their equivalents, to such agencies and the use of commercially reasonable efforts to obtain approval of such BLAs, or their equivalents, (iii) if the REVERSE-IT trial of bentracimab is completed or terminated and either (a) the primary endpoint in the REVERSE-IT trial is not achieved or (b) SFJ reasonably determines that the results of the trial do not support regulatory approval, (iv) upon the bankruptcy of the other party, (v) if the independent data monitoring committee for the REVERSE-IT trial of bentracimab recommends termination of the trial for safety or health reasons or for futility or the parties mutually agree that a material health or safety concern exists, or (vi) upon a breach by the other party involving improper payments or a violation of anti-corruption policies, unless such breach can be cured without having a materially adverse impact on the probability of completing clinical trials of bentracimab or obtaining regulatory approval for bentracimab.

In certain instances, upon the termination of the SFJ Agreement, we will be obligated to pay SFJ a multiple of the amounts paid or incurred by SFJ under the SFJ Agreement, including specifically:

- 300% of such amounts (1) in the event that SFJ terminates the SFJ Agreement due to a material uncured breach of the SFJ Agreement by us or our bankruptcy, (2) if we terminate the SFJ Agreement at will prior to the first regulatory approval of bentracimab, or (3) if the SFJ Agreement is terminated due to a safety concern and such termination either (a) arose from our gross negligence, or (b) is due to a serious safety issue that was known to us on the date of the SFJ Agreement but the data demonstrating such serious safety issue were not disclosed to SFJ or publicly known prior to the date of the SFJ Agreement;
- 150% of such amounts if SFJ terminates the SFJ Agreement (1) upon a change of control of us or (2) upon a breach involving improper payments or a violation of anti-corruption policies by us, unless such breach can be cured without having a materially adverse impact on the probability of completing clinical trials of bentracimab or obtaining regulatory approval for bentracimab;
- 100% of such amounts in the event of a termination due to an Adverse Patent Impact; and
- 100% of such amounts (plus an amount reflecting interest on such amounts) at an annual rate of 25% in the event of termination by SFJ due to disagreement with certain decisions made by us as part of the joint steering committee.

In addition, if following termination of the SFJ Agreement we continue to develop bentracimab and obtain approval of a BLA (or its equivalent) in the United States, the European Union, Japan or China, we will make the applicable approval payments for such jurisdiction to SFJ as if the SFJ Agreement had not been terminated, less any payments made upon termination, except that if we terminate the SFJ Agreement for SFJ's failure to make any payment to us when due, or SFJ terminates the SFJ Agreement due to a material adverse event, as defined in the SFJ Agreement, then our obligation to make such approval payments would be reduced by 50%.

Duke License Agreement

In October 2006, we entered into an exclusive license agreement with Duke, which was most recently amended in April 2019, or the Duke License. Pursuant to the Duke License, Duke granted to us an exclusive, worldwide license under certain patent rights owned or controlled by Duke, and a non-exclusive, worldwide license under certain know-how of Duke, to develop and commercialize any products or processes covered by the Duke License, or the Duke licensed products, relating to ELPs. The in-licensed patent rights are generally directed to providing extended exposure for proteins and peptides administered through subcutaneous injections and include 13 registered patents in the United States, 24 registered patents in foreign jurisdictions, two pending patent applications in the United States and four pending foreign applications. The last patent is expected to expire in 2030 without extension.

We have the right to sublicense the Duke licensed products to third parties subject to certain conditions specified in the Duke License. In May 2017, certain patent rights under the Duke License reverted to Duke, and Duke subsequently granted to us a non-exclusive license under such patent rights to develop and commercialize any products or processes involving such patent rights. We also granted back to Duke an exclusive sublicense under certain patent rights licensed to us under the Duke License and a non-exclusive license under certain patent rights owned or controlled by us, in each case to exploit compounds developed using our proprietary ELP technology.

Under the terms of the Duke License, we have paid or are required to pay:

- an upfront fee of $37,000;
- amendment fees of $0.2 million related to subsequent amendments of the Duke License;
- additional licensing fees of $0.2 million;
- up to $2.2 million in clinical and regulatory milestone fees;
- up to $0.4 million in commercial milestone fees;
- low single-digit royalty percentages on net sales of Duke licensed products, with minimum aggregate royalty payments of $0.2 million payable following our achievement of certain commercial milestones; and
- up to the greater of $0.3 million or a low double-digit percentage of the fees we receive from a third party in consideration of forming a strategic alliance with respect to certain patent rights covered under the Duke License.

In consideration for license rights granted to us, we initially issued Duke 24,493 shares of our common stock. Until we had reached a certain stipulated equity milestone, which we reached in October 2007, we were obligated to issue additional shares of common stock to Duke from time to time so that its aggregate ownership represented 7.5% of our issued and outstanding capital stock.

From the inception of the Duke License through December 31, 2020, we have incurred royalty costs of $0.3 million under the Duke License. As of May 2017, Duke is required to pay us a percentage of revenue that it receives from granting a license or sublicense with respect to certain products covered under the Duke License. As of December 31, 2020, Duke has not paid us any of such fees. We also must pay Duke the first $1.0 million of non-royalty payments we receive from a sublicensee, and thereafter a low double-digit percentage of any additional non-royalty payments we receive.

The Duke License requires us to use commercially reasonable efforts to develop, obtain and maintain regulatory approval for and commercialize the Duke licensed products according to a particular development schedule throughout the term of the Duke License. We are required to apply for, prosecute and maintain all United States and foreign patent rights under the Duke License. In addition, our rights under the Duke License are not assignable without the prior written consent of Duke, except to a third-party acquirer by our merger or sale of our stock or assets, or to an affiliate of our company.

Unless earlier terminated, the Duke License automatically expires on the date on which all patent rights granted under the Duke License expire, or upon our bankruptcy, insolvency or certain similar occurrences. The Duke License may be terminated prior to its expiration:

- by mutual written consent of us and Duke;
- by us upon three months' written notice to Duke;
- by either party upon the other party's illegal conduct or guilty plea with respect to intentional fraud, willful misconduct or felony;
- by either party upon the other party's material breach of the Duke License that is not cured within the specified cure period based on the nature of such breach; and
- by Duke upon our decision to cease commercial development of the patent rights covered by the Duke License for a material period of time.

Upon termination of the Duke License, we grant to Duke an exclusive, royalty-free, sublicensable license under our patent rights and know-how to use any intellectual property developed by us in the course of exercising our rights under the Duke License.

Viamet Asset Purchase Agreement

In January 2020, we entered into an asset purchase agreement, or the PB6440 Agreement, with Viamet Pharmaceuticals Holdings, LLC and its wholly-owned subsidiary, Selenity Therapeutics (Bermuda), Ltd., or the Sellers, pursuant to which we acquired all of the assets and intellectual property rights related to PB6440, the Sellers' proprietary CYP11B2 inhibitor compound (formerly known as SE-6440 or VT-6440) and certain other CYP11B2 inhibitor compounds that are covered by the patent rights acquired by us under the PB6440 Agreement, or together, the Compounds. The acquired patent

rights include 20 issued or pending United States and foreign patents and patent applications, with the last issued patent acquired expected to expire in 2037. Under the terms of the PB6440 Agreement, we paid the Sellers an upfront fee of $0.1 million upon the closing of the transaction, and we are required to pay the Sellers up to $5.1 million upon the achievement of certain development and intellectual property milestones with respect to certain product candidates that contain a Compound, up to $142.5 million upon the achievement of certain commercial milestones with respect to any approved product that contains a Compound, and low- to mid-single digit royalty percentages on the net sales of approved products that contain a Compound, subject to customary reductions and offsets in specified circumstances.

BioVectra Supply Agreement

In March 2021, we entered into a supply agreement, or BioVectra Agreement, with BioVectra Inc., or BioVectra, for the manufacture and supply by BioVectra of bulk drug substance for bentracimab for commercial distribution following regulatory approval, if obtained. Under the terms of the BioVectra Agreement, BioVectra has committed to maintaining capacity to manufacture an agreed number of batches of product each year, and we have committed to purchase a specified minimum number of batches of product per year, or the Minimum Annual Commitment, although we are free to contract with third parties for the manufacture of bentracimab.

We will pay a supply price per batch of product to be determined after the manufacturing process for the product is validated in accordance with the BioVectra Agreement, plus the cost of certain consumables, raw materials, and third-party testing. The parties have agreed that the initial supply price of product will be within a specified percentage of the estimated supply price set forth in the BioVectra Agreement and will remain firm through the second anniversary of validation. Thereafter, on an annual basis following the second anniversary of validation, either party may propose adjustments to the supply price for increases or decreases based on a specified inflation rate, subject to a maximum inflation adjustment per year, and BioVectra may propose adjusting the supply price beyond that inflation rate if it can document extraordinary increases or decreases in costs, subject to a specified maximum percentage increase or decrease per year.

Pursuant to the Minimum Annual Commitments, we are obligated to purchase a minimum of (i) approximately $14.0 million of batches of product in years 2022 through 2023, (ii) approximately $37.0 million of batches of product in 2024, and (iii) approximately $48.0 million of batches of product in each of years 2025 through 2031. In the event we do not purchase the applicable Minimum Annual Commitment in a given year, we will be obligated to make a payment to BioVectra in an amount equal to the then-applicable supply price per batch multiplied by the difference between the Minimum Annual Commitment for such year and the number of batches of product we actually purchased in such year, or the Minimum Shortfall Payment, except in the event that BioVectra was unable to deliver the number of batches ordered by us in such year. In the event of certain serious or extended failures by BioVectra to supply product in the quantities ordered by us in a given year, our Minimum Annual Commitment for such year (and potentially one or more subsequent years) will be subject to reduction, and our obligation to make a Minimum Shortfall Payment for such year (and potentially one or more subsequent years) will be waived. We will have the right to reduce the Minimum Annual Commitments for the year 2026 and subsequent years by up to a specified maximum percentage per year. Further, if we are only able to obtain regulatory approval for products incorporating bentracimab in only one of the United States or Europe, BioVectra and we have agreed to discuss in good faith an amendment to the BioVectra Agreement to reflect decreased requirements for product and impacts to the supply price to reflect lower volume commitments.

The initial term of the BioVectra Agreement commences on the effective date of the BioVectra Agreement and continues until the tenth anniversary of Validation. The term of the BioVectra Agreement may be extended for additional one-year periods upon mutual agreement of the parties. Either party may terminate the BioVectra Agreement in the event of an uncured material breach by the other party or upon the occurrence of certain events of insolvency of the other party. We may terminate the BioVectra Agreement (i) in the event of certain regulatory compliance failures by BioVectra or any person employed or retained by it to perform services under the BioVectra Agreement, or (ii) subject to payment of a termination fee to BioVectra (the amount of which decreases over the term of the BioVectra Agreement from an initial maximum in the mid-teens of millions of dollars to zero), in the event we decide that it will not, or is unable to, pursue regulatory approval or commercialization of products incorporating bentracimab or in the event of termination of our license to the product from MedImmune Limited. We may also terminate the BioVectra Agreement without cause and without payment of a termination fee upon 24 months' notice following the fifth anniversary of regulatory approval of a product incorporating bentracimab by either the FDA or the EMA.

Manufacturing

Our large molecule clinical product candidates bentracimab and pemziviptadil and our ELP preclinical and research and development pipeline candidates are currently manufactured using a microbial expression system. Our manufacturing utilizes a straight-forward *E. coli* fermentation process with a simple column chromatography-based purification

process. Our small molecule candidate, PB6440 is manufactured through chemical synthesis. We believe that these manufacturing processes will enable our product candidates to be manufactured efficiently for clinical and commercial applications. We do not have any cGMP manufacturing facilities. Instead, we utilize third parties for the cGMP manufacture of our product candidates for clinical trials, and we intend to continue to use third parties in the near term for the future clinical development and, if they are approved, commercial manufacture of our drug products. Our contract manufacturers are FDA-inspected establishments that have a history of supplying products to the pharmaceutical industry in accordance with cGMP.

Bentracimab

Bentracimab bulk drug substance, provided to us pursuant to the MedImmune License, was filled and released for use in our initial clinical trials. The bentracimab drug substance was manufactured by Wacker Biotech GmbH, or Wacker, a third-party contract manufacturer, utilizing Wacker's proprietary *E. coli* strain. Manufacturing has continued at Wacker to generate drug supply for our ongoing clinical trials. We have also engaged BioVectra to serve as our contract manufacturer of bentracimab for our ongoing clinical trials and for commercial-scale production of bentracimab, if approved, although we are free to contract with third parties for the manufacture of drug supply.

Pemziviptadil and our ELP Preclinical Pipeline

To date, we have relied on a non-proprietary *E. coli* strain for the production of pemziviptadil and our preclinical ELP pipeline candidates. Third-party manufacturers have performed the cGMP manufacturing of the drug product. Due to efficiencies achieved to date, we intend to utilize this non-proprietary strain for future manufacturing. As we advance pemziviptadil and other preclinical product candidates through development, we intend to establish additional supply agreements and/or technology transfer agreements in order to meet our expected needs for future clinical trials and potential commercial demand.

PB6440

PB6440 is a small molecule candidate manufactured through chemical synthesis. Third-party manufacturers will perform the cGMP manufacturing of the drug. As we advance PB6440 through development, we intend to establish additional supply agreements and/or technology transfer agreements in order to meet our expected needs for future clinical trials and potential commercial demand.

Sales and Marketing

We retain worldwide commercial rights to all of our product candidates. Given our stage of development, we have not yet established a commercial organization or distribution capabilities. We intend to commercialize bentracimab, if approved, independently in the United States because we believe the patient populations and medical specialists for these indications are sufficiently concentrated to allow us to effectively promote these products with a targeted sales team. We may explore, and selectively pursue, strategic collaborations or partnerships with third parties to commercialize pemziviptadil, if approved, in the United States and any approved products outside of the United States in order to maximize the commercial potential of our products.

Competition

The pharmaceutical industry is subject to rapidly advancing technologies, intense competition and a strong emphasis on proprietary products. We face potential competition from many different sources, including major pharmaceutical, specialty pharmaceutical and biotechnology companies, academic institutions, governmental agencies and public and private research institutions. Any product candidates that we successfully develop and commercialize will compete with existing treatments and new treatments that may become available in the future.

Our current and potential future competitors have significantly more experience commercializing drugs that have been approved for marketing. Mergers and acquisitions in the pharmaceutical and biotechnology industries could result in even more resources being concentrated among a small number of our competitors. Accordingly, our competitors may be more successful than us in obtaining regulatory approval for therapies and in achieving widespread market acceptance of their drugs. It is also possible that the development of a cure or more effective treatment method for the disorders we are targeting by a competitor could render our current or future drug candidates non-competitive or obsolete or reduce the demand for our drug candidates before we can recover our development and commercialization expenses.

Bentracimab

There are currently no other known reversal agents approved or in clinical development for ticagrelor or any other antiplatelet drugs. In the European Union, an extracorporeal whole blood purification adsorber device is available that may be useful for non-specific removal of ticagrelor during some cardiac procedures when used in conjunction with cardiopulmonary bypass. Upon approval, bentracimab would be the only therapeutic agent available for specific reversal of ticagrelor. As a result, market acceptance of bentracimab, if approved, will depend heavily on the continued market acceptance and use of ticagrelor. Ticagrelor competes against other commercially available antiplatelet therapies, including other $P2Y_{12}$ receptor antagonists, many of which are available as generic drugs and are therefore currently significantly less expensive than ticagrelor. New antiplatelet therapies may also be developed in the future, including other reversible $P2Y_{12}$ receptor antagonists and other antiplatelet therapies, which could also have reversal agents, that could displace ticagrelor as the preferred antiplatelet agent for ACS.

Pemziviptadil

Although we anticipate that pemziviptadil may be used as a complement to patients' existing therapies, we expect to compete with existing treatments for PAH patients with class II through class IV symptoms that target the endothelin, nitric oxide and prostacyclin pathways, as well as any generic equivalents that may be developed. In addition to currently approved drugs within these classes, we are also aware of a number of PAH therapies in clinical development, including:

- *Ralinepag*, an oral IP prostacyclin receptor agonist being developed by Arena Pharmaceuticals;
- *Trevyent*, a formulation of treprostinil being developed by United Therapeutics;
- *Bardoxolone methyl*, an oral therapy being developed by Reata Pharmaceuticals for connective tissue disease-associated PAH;
- *LIQ861*, a powder formulation of treprostinil designed for deep-lung delivery using a disposable, dry powder inhaler being developed by Liquidia Technologies;
- *CAM2043*, a liquid crystal gel formulation of treprostinil as a once-weekly subcutaneous depot injection being developed by Camurus;
- *Treprostinil Technosphere*, an inhaled, dry powder formulation of treprostinil being developed by MannKind Corporation;
- *Beraprost sodium 314d modified release*, a single isomer oral prostacyclin analogue being developed by Lung Biotechnology PBC;
- *Sotatercept*, a ligand trap in development by Acceleron to rebalance BMPR-II signaling for patients with PAH;
- *Seralutinib (GB002)*, an inhaled PDGFR inhibitor in development by Gossamer Bio;
- *INS1009*, an inhaled nanoparticle formulation of a treprostinil prodrug being developed by Insmed Incorporated; and
- *INOpulse*, inhaled nitric oxide being developed by Bellerophon Therapeutics.

PB6440

Although we anticipate that PB6440 may be used as a complement to patients' existing antihypertensive therapies, we expect to compete with existing generic treatments for hypertension that target the mineralocorticoid receptor. In addition to the currently approved mineralocorticoid receptor antagonists, eplerenone and spironolactone, we are also aware of a number of therapies in clinical development for the treatment of resistant hypertension with which PB6440 would compete if approved, including:

- *Aprocitentan*, orally active dual endothelin receptor antagonist that is being developed by Janssen Biotech;
- *Firibastat*, a selective and specific inhibitor of Aminopeptidase A being developed by Quantum Genomics; and
- *CIN-107*, an aldosterone synthase inhibitor being developed by Cincor Pharmaceuticals.

Intellectual Property

Our commercial success depends in part upon our ability to obtain and maintain proprietary protection for bentracimab, pemziviptadil, PB6440 and future product candidates and related discoveries and our ELP technology; to operate without infringing on or otherwise violating the proprietary rights of others; and to prevent others from infringing or otherwise violating our proprietary rights. We seek to protect our proprietary position by, among other methods, filing United States and foreign patent applications related to our ELP technology, our product candidates and other proprietary technologies, inventions and improvements that are important to the development and implementation of our business. We also rely on trademarks, trade secrets, know-how, continuing technological innovation and potential in-licensing opportunities to develop and maintain our proprietary position.

The term of individual patents varies depending on the date of filing of the patent application and the legal term of patents in the countries in which they are obtained. Generally, patents issued from regularly filed applications in the United States are granted a term of 20 years from the earliest filing date of a non-provisional application. In addition, in certain instances, a patent term can be adjusted to recapture a portion of the delay by the United States Patent and Trademark Office in issuing the patent. In addition, a patent term may be extended to recapture a portion of the patent term effectively lost as a result of the FDA regulatory review period of the drug covered by the patent. The patent term extension based upon delay by the FDA can be up to five years beyond the expiration of the patent, but cannot extend the remaining term of a patent beyond a total of 14 years from the date of product approval and the extension may only apply to one patent that covers the approved drug (and to only those patent claims covering the approved drug or a method for using it). There can be no assurance that any such patent term adjustment or extension will be obtained. The duration of foreign patents varies in accordance with provisions of applicable local law, but typically in countries in which we file, the patent term is 20 years from the earliest filing date of a non-provisional patent application. However, the actual protection afforded by a patent varies on a product-by-product basis and from country to country and depends upon many factors, including the type of patent, the scope of its coverage, the availability of regulatory-related extensions, the availability of legal remedies in a particular country and the validity and enforceability of the patent.

Furthermore, we rely upon trade secrets, know-how and continuing technological innovation to develop and maintain our competitive position. We seek to protect our proprietary information, in part, using confidentiality agreements with our commercial partners, collaborators, employees and consultants and invention assignment agreements with our employees. We also have confidentiality agreements or invention assignment agreements with our commercial partners and selected consultants. These agreements are designed to protect our proprietary information and, in the case of the invention assignment agreements, to grant us ownership of technologies that are developed through a relationship with a third party. These agreements may be breached and we may not have adequate remedies for any such breach. In addition, our trade secrets may otherwise become known or be independently discovered by competitors. To the extent that our commercial partners, collaborators, employees and consultants use intellectual property owned by others in their work for us, disputes may arise as to the rights in related or resulting know-how and inventions.

As of December 31, 2020, our patent estate contained at least 22 patent families that we own or in-license that protect various aspects of our ELP technology or our product candidates. We own or have rights in 24 United States patents, 15 United States patent applications, 107 foreign patents and 64 foreign patent applications.

Bentracimab

With regard to bentracimab, we in-licensed one patent family. As of December 31, 2020, this patent family included two issued United States patents with composition of matter claims covering bentracimab that are expected to expire in 2035 and 2036 without taking patent term extensions into account, three pending United States patent applications, two issued foreign patents, and 13 pending foreign applications, that if issued, would expire in 2035.

Pemziviptadil

As of December 31, 2020, our portfolio of owned and in-licensed patents and patent applications relating to pemziviptadil consisted of eight issued patents in the United States, 10 pending applications in the United States, 72 granted foreign patents and nine pending foreign applications with claims directed to compositions of matter covering pemziviptadil and methods of use thereof, including use in PAH, cystic fibrosis and cardiomyopathy associated with DMD, that we expect to expire between 2027 and 2041, without taking patent term extensions into account.

PB6440

Upon acquiring the intellectual property rights of PB6440 in January 2020, we acquired three patent families relating to aldosterone synthase inhibitors, which as of December 31, 2020 consisted of three granted patents in the United

States, two pending applications in the United States and 15 pending foreign applications. The granted United States patents are expected to expire in 2037 without taking patent term extensions into account.

ELP Technology

As of December 31, 2020, we owned two patent families relating to our ELP technology, which consist of two granted patents in the United States, two pending applications in the United States and ten pending foreign applications. The first granted patent is expected to expire in 2021 and the second is expected to expire in 2035, without taking patent term extensions into account.

Government Regulation and Product Approval

The FDA and other regulatory authorities at federal, state and local levels, as well as in foreign countries, extensively regulate, among other things, the research, development, testing, manufacture, quality control, import, export, safety, effectiveness, labeling, packaging, storage, distribution, record keeping, approval, advertising, promotion, marketing, post-approval monitoring and post-approval reporting of biologics such as those we are developing. We, along with third-party contractors, will be required to navigate the various preclinical, clinical and commercial approval requirements of the governing regulatory agencies of the countries in which we wish to conduct studies or seek approval or licensure of our product candidates.

The process required by the FDA before biologic product candidates may be marketed in the United States generally involves the following:

- completion of preclinical laboratory tests and animal studies performed in accordance with the FDA's Good Laboratory Practices, or GLP, regulation;
- submission to the FDA of an IND, which must become effective before clinical trials may begin and must be updated annually or when significant changes are made;
- approval by an independent Institutional Review Board, or IRB, or ethics committee at each clinical site before the trial is commenced;
- performance of adequate and well-controlled human clinical trials to establish the safety, purity and potency of the proposed biologic product candidate for its intended purpose;
- preparation of and submission to the FDA of a BLA after completion of all pivotal clinical trials;
- satisfactory completion of an FDA Advisory Committee review, if applicable;
- a determination by the FDA within 60 days of its receipt of a BLA to file the application for review;
- satisfactory completion of an FDA pre-approval inspection of the manufacturing facility or facilities at which the proposed product is produced to assess compliance with cGMP and to assure that the facilities, methods and controls are adequate to preserve the biological product's continued safety, purity and potency and of selected clinical investigation sites to assess compliance with Good Clinical Practices, or GCP; and
- FDA review and approval of the BLA to permit commercial marketing of the product for particular indications for use in the United States.

Preclinical and Clinical Development

Prior to beginning the first clinical trial with a product candidate, we must submit an IND to the FDA. An IND is a request for authorization from the FDA to administer an investigational new drug product to humans. The central focus of an IND submission is on the general investigational plan and the protocol(s) for clinical studies. The IND also includes results of animal and *in vitro* studies assessing the toxicology, pharmacokinetics, pharmacology and pharmacodynamic characteristics of the product; chemistry, manufacturing and controls information; and any available human data or literature to support the use of the investigational product. An IND must become effective before human clinical trials may begin. The IND automatically becomes effective 30 days after receipt by the FDA, unless the FDA, within the 30-day time period, raises safety concerns or questions about the proposed clinical trial. In such a case, the IND may be placed on clinical hold and the IND sponsor and the FDA must resolve any outstanding concerns or questions before the clinical trial can begin. Submission of an IND therefore may or may not result in FDA authorization to begin a clinical trial.

Clinical trials involve the administration of the investigational product to human subjects under the supervision of qualified investigators in accordance with GCPs, which include the requirement that all research subjects provide their informed consent for their participation in any clinical trial. Clinical trials are conducted under protocols detailing, among other things, the objectives of the trial, the parameters to be used in monitoring safety and the effectiveness criteria to be evaluated. A separate submission to the existing IND must be made for each successive clinical trial conducted during product development and for any subsequent protocol amendments. Furthermore, an independent IRB for each site proposing to conduct the clinical trial must review and approve the plan for any clinical trial and its informed consent form before the clinical trial begins at that site and must monitor the trial until completed. Regulatory authorities, the IRB or the sponsor may suspend a clinical trial at any time on various grounds, including a finding that the subjects are being exposed to an unacceptable health risk or that the trial is unlikely to meet its stated objectives. Some trials also include oversight by an independent group of qualified experts organized by the clinical trial sponsor, known as a data safety monitoring board, which provides authorization for whether or not a trial may move forward at designated check points based on access to certain data from the trial and may halt the clinical trial if it determines that there is an unacceptable safety risk for subjects or other grounds, such as no demonstration of efficacy. There are also requirements governing the reporting of ongoing clinical trials and clinical trial results to public registries.

For purposes of BLA approval, human clinical trials are typically conducted in three sequential phases that may overlap.

- Phase 1—The investigational product is initially introduced into healthy human subjects or patients with the target disease or condition. These studies are designed to test the safety, dosage tolerance, absorption, metabolism and distribution of the investigational product in humans, the side effects associated with increasing doses and, if possible, to gain early evidence on effectiveness.
- Phase 2—The investigational product is administered to a limited patient population with a specified disease or condition to evaluate the preliminary efficacy, optimal dosages and dosing schedule and to identify possible adverse side effects and safety risks. Multiple Phase 2 clinical trials may be conducted to obtain information prior to beginning larger and more expensive Phase 3 clinical trials.
- Phase 3—The investigational product is administered to an expanded patient population to further evaluate dosage, to provide statistically significant evidence of clinical efficacy and to further test for safety, generally at multiple geographically dispersed clinical trial sites. These clinical trials are intended to establish the overall risk/benefit ratio of the investigational product and to provide an adequate basis for product approval.

In some cases, the FDA may require, or companies may voluntarily pursue, additional clinical trials after a product is approved to gain more information about the product. These so-called Phase 4 studies may be made a condition to approval of the BLA. Concurrent with clinical trials, companies may complete additional animal studies and develop additional information about the biological characteristics of the product candidate and must 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, must develop methods for testing the identity, strength, quality and purity of the final product or, for biologics, the safety, purity and potency. Additionally, 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.

BLA Submission and Review

Assuming successful completion of all required testing in accordance with all applicable regulatory requirements, the results of product development, nonclinical studies and clinical trials are submitted to the FDA as part of a BLA requesting approval to market the product for one or more indications. The BLA must include all relevant data available from pertinent preclinical and clinical studies, including negative or ambiguous results as well as positive findings, together with detailed information relating to the product's chemistry, manufacturing, controls and proposed labeling, among other things. The submission of a BLA requires payment of a substantial application user fee to FDA, unless a waiver or exemption applies.

Once a BLA has been submitted, the FDA's goal is to review standard applications within ten months after it accepts the application for filing or, if the application qualifies for priority review, six months after the FDA accepts the application for filing. In both standard and priority reviews, the review process is often significantly extended by FDA requests for additional information or clarification. The FDA reviews a BLA to determine, among other things, whether a product is safe, pure and potent and the facility in which it is manufactured, processed, packed or held meets standards designed to assure the product's continued safety, purity and potency. The FDA may convene an advisory committee to provide clinical insight on application review questions. Before approving a BLA, the FDA will typically 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 a BLA, the FDA will typically inspect one or more clinical sites to assure compliance with GCP. If the FDA determines that the application, manufacturing process or manufacturing facilities are not acceptable, it will outline the deficiencies in the submission and often will request additional testing or information. Notwithstanding the submission of any requested additional information, the FDA ultimately may decide that the application does not satisfy the regulatory criteria for approval.

After the FDA evaluates a BLA and conducts inspections of manufacturing facilities where the investigational product and/or its drug substance will be produced, the FDA may issue an approval letter or a Complete Response letter. An approval letter authorizes commercial marketing of the product with specific prescribing information for specific indications. A Complete Response letter will describe all of the deficiencies that the FDA has identified in the BLA, except that where the FDA determines that the data supporting the application are inadequate to support approval, the FDA may issue the Complete Response letter without first conducting required inspections, testing submitted product lots and/or reviewing proposed labeling. In issuing the Complete Response letter, the FDA may recommend actions that the applicant might take to place the BLA in condition for approval, including requests for additional information or clarification. The FDA may delay or refuse approval of a BLA if applicable regulatory criteria are not satisfied, require additional testing or information and/or require post-marketing testing and surveillance to monitor safety or efficacy of a product.

If regulatory approval of a product is granted, such approval will be granted for particular indications and may entail limitations on the indicated uses for which such product may be marketed. For example, the FDA may approve the BLA with a Risk Evaluation and Mitigation Strategy, or REMS, to ensure the benefits of the product outweigh its risks. A REMS is a safety strategy to manage a known or potential serious risk associated with a product and to enable patients to have continued access to such medicines by managing their safe use and 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. The FDA also may condition approval on, among other things, changes to proposed labeling or the development of adequate controls and specifications. Once approved, the FDA may withdraw the product approval if compliance with pre- and post-marketing requirements is not maintained or if problems occur after the product reaches the marketplace. The FDA may require one or more Phase 4 post-marketing studies and surveillance to further assess and monitor the product’s safety and effectiveness after commercialization and may limit further marketing of the product based on the results of these post-marketing studies.

Accelerated Approval Program

Any marketing application for a biologic submitted to the FDA for approval may be eligible for FDA programs intended to expedite the FDA review and approval process, such as priority review and accelerated approval. A product is eligible for priority review if it has the potential to provide a significant improvement in the treatment, diagnosis or prevention of a serious disease or condition compared to marketed products. For biologic products, priority review designation means the FDA’s goal is to take action on the marketing application within six months of the 60-day filing date (compared with ten months under standard review).

Additionally, products studied for their safety and effectiveness in treating serious or life-threatening diseases or conditions may receive 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 accelerated approval, the FDA will generally require the sponsor to perform adequate and well-controlled post-marketing clinical studies to verify and describe the anticipated effect on irreversible morbidity or mortality or other clinical benefit. 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.

Priority review and accelerated approval do not change the standards for approval but may expedite the development or approval process.

Orphan Drug Designation

Under the Orphan Drug Act, the FDA may grant orphan designation to a drug or biologic intended to treat a rare disease or condition, which is a disease or condition that affects fewer than 200,000 individuals in the United States, or more than 200,000 individuals in the United States for which there is no reasonable expectation that the cost of developing and

making available in the United States a drug or biologic for this type of disease or condition will be recovered from sales in the United States for that drug or biologic. Orphan drug designation must be requested before submitting a BLA. After the FDA grants orphan drug designation, the generic identity of the therapeutic agent and its potential orphan use are disclosed publicly by the FDA. The orphan drug designation does not convey any advantage in, or shorten the duration of, the regulatory review or approval process.

If a product that has orphan drug designation subsequently receives the first FDA approval for the disease for which it has such designation, the product is entitled to orphan drug exclusive approval (or exclusivity), which means that the FDA may not approve any other applications, including a full BLA, to market the same drug or biologic for the same indication for seven years, except in limited circumstances, such as a showing of clinical superiority to the product with orphan drug exclusivity. Orphan drug exclusivity does not prevent FDA from approving a different drug or biologic for the same disease or condition or the same drug or biologic for a different disease or condition. Among the other benefits of orphan drug designation are tax credits for certain research and a waiver of the BLA application fee.

A designated orphan drug may not receive orphan drug exclusivity if it is approved for a use that is broader than the indication for which it received orphan designation. In addition, exclusive marketing rights in the United States may be lost if the FDA later determines that the request for designation was materially defective or if the manufacturer is unable to assure sufficient quantities of the product to meet the needs of patients with the rare disease or condition.

Breakthrough Therapy Designation

To qualify for the Breakthrough Therapy program, product candidates must be intended to treat a serious or life-threatening disease or condition and preliminary clinical evidence must indicate that such product candidates may demonstrate substantial improvement on one or more clinically significant endpoints over existing therapies. The FDA will seek to ensure the sponsor of a Breakthrough Therapy product candidate receives: intensive guidance on an efficient drug development program; intensive involvement of senior managers and experienced staff on a proactive, collaborative and cross-disciplinary review; and rolling review. Breakthrough Therapy designation does not change the standards for approval but may expedite the development or approval process.

Post-Approval Requirements

Any products manufactured or distributed by us pursuant to FDA approvals are subject to pervasive and continuing regulation by the FDA, including, among other things, requirements relating to record-keeping, reporting of adverse experiences, periodic reporting, product sampling and distribution and advertising and promotion of the product. After approval, most changes to the approved product, such as adding new indications or other labeling claims, are subject to prior FDA review and approval. There also are continuing user fee requirements, under which FDA assesses an annual program fee for each product identified in an approved BLA. Biologic manufacturers and their subcontractors 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, which impose certain procedural and documentation requirements upon us and our third-party manufacturers. Changes to the manufacturing process are strictly regulated and, depending on the significance of the change, may require prior FDA approval before being implemented. FDA regulations also require investigation and correction of any deviations from cGMP and impose reporting requirements upon us and any third-party manufacturers that we may decide to use. Accordingly, manufacturers must continue to expend time, money and effort in the area of production and quality control to maintain compliance with cGMP and other aspects of regulatory compliance.

The FDA may withdraw approval if compliance with regulatory requirements and standards is not maintained or if problems occur after the product reaches the market. Later discovery of previously unknown problems with a product, including AEs of unanticipated severity or frequency, or with manufacturing processes, or failure to comply with regulatory requirements, may result in revisions to the approved labeling to add new safety information; imposition of post-market studies or clinical studies to assess new safety risks; or imposition of distribution restrictions or other restrictions under a REMS program. Other potential consequences include, among other things:

- restrictions on the marketing or manufacturing of a product, complete withdrawal of the product from the market or product recalls;
- fines, warning letters or holds on post-approval clinical studies;
- refusal of the FDA to approve pending applications or supplements to approved applications, or suspension or revocation of existing product approvals;
- product seizure or detention, or refusal of the FDA to permit the import or export of products; or

- injunctions or the imposition of civil or criminal penalties.

The FDA closely regulates the marketing, labeling, advertising and promotion of biologics. A company can make only those claims relating to safety and efficacy, purity and potency that are approved by the FDA and in accordance with the provisions of the approved label. The FDA and other agencies actively enforce the laws and regulations prohibiting the promotion of off-label uses. Failure to comply with these requirements can result in, among other things, adverse publicity, warning letters, corrective advertising and potential civil and criminal penalties. Physicians may prescribe legally available products for uses that are not described in the product's labeling and that differ from those tested by us and approved by the FDA. Such off-label uses are common across medical specialties. Physicians may believe that such off-label uses are the best treatment for many patients in varied circumstances. The FDA does not regulate the behavior of physicians in their choice of treatments. The FDA does, however, restrict manufacturer's communications on the subject of off-label use of their products.

Biosimilars and Reference Product Exclusivity

The Patient Protection and Affordable Care Act, as amended by the Health Care and Education Reconciliation Act, or collectively, the ACA, signed into law in 2010, includes a subtitle called the Biologics Price Competition and Innovation Act of 2009, or the BPCIA, which created an abbreviated approval pathway for biological products that are biosimilar to or interchangeable with an FDA-approved reference biological product. To date, a number of biosimilars have been licensed under the BPCIA, and numerous biosimilars have been approved in Europe. The FDA has issued several guidance documents outlining an approach to review and approval of biosimilars.

Biosimilarity, which requires that there be no clinically meaningful differences between the biological product and the reference product in terms of safety, purity and potency, can be shown through analytical studies, animal studies and a clinical study or studies. Interchangeability requires that a product is biosimilar to the reference product and the product must demonstrate that it can be expected to produce the same clinical results as the reference product in any given patient and, for products that are administered multiple times to an individual, the biologic and the reference biologic may be alternated or switched after one has been previously administered without increasing safety risks or risks of diminished efficacy relative to exclusive use of the reference biologic. Complexities associated with the larger, and often more complex, structures of biological products, as well as the processes by which such products are manufactured, pose significant hurdles to implementation of the abbreviated approval pathway that are still being worked out by the FDA.

Under the BPCIA, an application for a biosimilar product may not be submitted to the FDA until four years following the date that the reference product was first licensed by the FDA. In addition, the approval of a biosimilar product may not be made effective by the FDA until 12 years from the date on which the reference product was first licensed. During this 12-year period of exclusivity, another company may still market a competing version of the reference product if the FDA approves a full BLA for the competing product containing that applicant's own preclinical data and data from adequate and well-controlled clinical trials to demonstrate the safety, purity and potency of its product. The BPCIA also created certain exclusivity periods for biosimilars approved as interchangeable products. At this juncture, it is unclear whether products deemed "interchangeable" by the FDA will, in fact, be readily substituted by pharmacies, which are governed by state pharmacy law.

The BPCIA is complex and continues to be interpreted and implemented by the FDA. In addition, recent government proposals have sought to reduce the 12-year reference product exclusivity period. Other aspects of the BPCIA, some of which may impact the BPCIA exclusivity provisions, have also been the subject of recent litigation. As a result, the ultimate impact, implementation and impact of the BPCIA is subject to significant uncertainty.

Federal and State Fraud and Abuse, Data Privacy and Security and Transparency Laws and Regulations

In addition to FDA restrictions on marketing of pharmaceutical products, federal and state healthcare laws and regulations restrict business practices in the biopharmaceutical industry. These laws may impact, among other things, our current and future business operations, including our clinical research activities and proposed sales, marketing and education programs and constrain the business or financial arrangements and relationships with healthcare providers and other parties through which we market, sell and distribute our products for which we obtain marketing approval. These laws include anti-kickback and false claims laws and regulations, data privacy and security and transparency laws and regulations, including, without limitation, those laws described below.

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. The term "remuneration" has been broadly interpreted to include anything of value. The federal Anti-Kickback Statute has been interpreted to apply to arrangements between pharmaceutical manufacturers on one hand and prescribers, purchasers and formulary managers on the other hand. Although there are a number of statutory exceptions and regulatory safe harbors protecting some common activities from prosecution, the exceptions and safe harbors are drawn narrowly. Practices that involve remuneration that may be alleged to be intended to induce prescribing, purchases or recommendations may be subject to scrutiny if they do not qualify for an exception or safe harbor.

In addition, 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. Further, 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 False Claims Act and the civil monetary penalties statute.

The federal civil and criminal false claims laws, including the False Claims Act, which 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 or 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. A claim includes "any request or demand" for money or property presented to the United States government. Several pharmaceutical and other healthcare companies have been prosecuted under these laws for allegedly providing free product to customers with the expectation that the customers would bill federal programs for the product. Other companies have been prosecuted for causing false claims to be submitted because of the companies' marketing of products for unapproved, and thus non-reimbursable, uses.

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 federal Anti-Kickback Statute, a person or entity does not need to have actual knowledge of the statute 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, or HITECH, and their respective implementing regulations, impose certain requirements relating to the privacy, security and transmission of individually identifiable health information without appropriate authorization on certain health plans, healthcare clearinghouses and certain healthcare providers, known as covered entities, and their respective business associates, independent contractors that perform certain services involving the use or disclosure of individually identifiable health information, as well as their covered subcontractors. HITECH also created new tiers of civil monetary penalties, amended HIPAA to make civil and criminal penalties directly applicable to business associates and gave state attorneys general new authority to file civil actions for damages or injunctions in federal courts to enforce HIPAA and seek attorneys' fees and costs associated with pursuing federal civil actions.

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 (defined to include doctors, dentists, optometrists, podiatrists, and chiropractors) 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. Beginning in 2022, applicable manufacturers will also be required to report information regarding payments and other transfers of value provided during the previous year to physician assistants, nurse practitioners, clinical nurse specialists, certified nurse anesthetists, anesthesiologist assistants, and certified nuse-midwives.

We may also be subject to state and foreign law equivalents of each of the above federal laws; state laws that require manufacturers to report information related to payments and other transfers of value to physicians and other healthcare providers or marketing expenditures; 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 that otherwise restrict payments that may be made to healthcare providers; state and local laws that require the registration of pharmaceutical sales representatives; as well as state and foreign laws that govern 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.

Efforts to ensure that our business arrangements with third parties will comply with applicable healthcare laws and regulations will involve substantial costs. Because of the breadth of these laws and the narrowness of the statutory exceptions and regulatory safe harbors available, it is possible that some of our business activities could be subject to challenge under one or more of such laws. It is possible that governmental authorities will conclude that our business practices may not comply with current or future statutes, regulations 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 these laws or any other governmental regulations that may apply to us, we may be subject to significant civil, criminal and administrative penalties, damages, fines, disgorgement, imprisonment, exclusion from participating in government funded healthcare programs, such as Medicare and Medicaid, 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 and the curtailment or restructuring of our operations. To the extent that any of our products are sold in a foreign country, we may be subject to similar foreign laws and regulations, which may include, for instance, applicable post-marketing requirements, including safety surveillance, anti-fraud and abuse laws and implementation of corporate compliance programs and reporting of payments or transfers of value to healthcare professionals.

We are also subject to additional federal laws, such as the United States Foreign Corrupt Practices Act, or the FCPA, which prohibits, any United States individual or business from paying, offering, or authorizing payment or offering of anything of value, directly or indirectly, to any foreign official, political party, or candidate for the purpose of influencing any act or decision of the foreign entity in order to assist the individual or business in obtaining or retaining business. The FCPA also obligates companies whose securities are listed in the United States to comply with accounting provisions requiring the company to maintain books and records that accurately and fairly reflect all transactions of the corporation, including international subsidiaries, and to devise and maintain an adequate system of internal accounting controls for international operations. In many other countries, the healthcare providers who prescribe pharmaceuticals are employed by their government, and the purchasers of pharmaceuticals are government entities; therefore, our dealings with these prescribers and purchasers would be subject to regulation under the FCPA. Activities that violate the FCPA, even if they occur wholly outside the United States, can result in criminal and civil fines, imprisonment, disgorgement, oversight, and debarment from government contracts.

Coverage and Reimbursement

Market acceptance and sales of any drug products depend in part on coverage and the extent to which adequate reimbursement for drug products will be available from third-party payors, including government health administration authorities, managed care organizations and other private health insurers. Coverage and reimbursement for our product also depends on coverage and adequate reimbursement for the procedures using bentracimab as a ticagrelor reversal agent and pemziviptadil for the treatment of PAH. Obtaining coverage and adequate reimbursement for our products may be particularly difficult because of the higher prices often associated with drugs administered under the supervision of a physician. Separate reimbursement for the product itself or the treatment or procedure in which our product is used may not be available. Even if the procedure using our product is covered, third-party payors may package the cost of the drug into the procedure payment and not separately reimburse the physician for the costs associated with our product. A decision by a third-party payor not to cover or separately reimburse for our products could reduce physician utilization of our products once approved. Additionally, in the United States, there is no uniform policy of coverage and reimbursement among third-party payors. Third-party payors often rely upon Medicare coverage policy and payment limitations in setting their own coverage and reimbursement policies. However, decisions regarding the extent of coverage and amount of reimbursement to be provided is made on a payor-by-payor basis. One payor’s determination to provide coverage for a drug product does not assure that other payors will also provide coverage and adequate reimbursement.

Third-party payors determine which medical procedures they will cover and establish reimbursement levels. Even if a third-party payor covers a particular procedure, the resulting reimbursement payment rates may not be adequate. Patients who are treated in-office for a medical condition generally rely on third-party payors to reimburse all or part of the costs associated with the procedure and may be unwilling to undergo such procedures in the absence of such coverage and adequate reimbursement.

Reimbursement by a third-party payor may depend upon a number of factors, including the third-party payor’s determination that a procedure is safe, effective and medically necessary; appropriate for the specific patient; cost-effective; supported by peer-reviewed medical journals; included in clinical practice guidelines; and neither cosmetic, experimental, nor investigational.

Further, from time to time, typically on an annual basis, payment rates are updated and revised by third-party payors. Such updates could impact the demand for our product candidates, to the extent that customers who are prescribed our product candidates, if approved, are not separately reimbursed for the cost of the product candidates. An example of payment

updates is the Medicare program updates to physician payments, which is completed on an annual basis. In the past, when the application of the formula resulted in lower payment, Congress has passed interim legislation to prevent the reductions. The Medicare Access and CHIP Reauthorization Act of 2015, or MACRA, ended the use of the statutory formula and introduced a merit-based incentive bonus program for Medicare physicians, also referred to as the Quality Payment Program. This program provides clinicians with two ways to participate, including through the Advanced Alternative Payment Models, or APMs, and the Merit-based Incentive Payment System, or MIPS. In November 2019, CMS issued a final rule finalizing the changes to the Quality Payment Program. The full impact to overall physician reimbursement as a result of the introduction of the Quality Payment Program remains unclear. Any reduction in reimbursement from Medicare or other government programs may result in a similar reduction in payments from private payors.

Impact of Healthcare Reform on our Business

In the United States and some foreign jurisdictions, there have been, and continue to be, several legislative and regulatory changes and proposed changes regarding the healthcare system that could prevent or delay marketing approval of drug product candidates, restrict or regulate post-approval activities and affect the profitable sale of drug product candidates.

Among policy makers and payors in the United States and elsewhere, 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 ACA was passed, which substantially changed the way healthcare is financed by both the government and private insurers, and significantly impacts the United States pharmaceutical industry. The ACA, among other things, contains a number of provisions of particular importance to the pharmaceutical and biotechnology industries, including, but not limited to, those governing enrollment in federal healthcare programs, a new methodology by which rebates owed by manufacturers under the Medicaid Drug Rebate Program are calculated for drugs that are inhaled, infused, implanted or injected, and annual fees based on pharmaceutical companies' share of sales to federal health care programs.

There have been executive, judicial and Congressional challenges to certain aspects of the ACA. While Congress has not passed comprehensive repeal legislation, bills affecting the implementation of certain taxes under the ACA have been signed into law. 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 ACA 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.” In addition, the 2020 federal spending package permanently eliminated, effective January 1, 2020, the ACA-mandated “Cadillac” tax on high-cost employer-sponsored health coverage and medical device tax and, effective January 1, 2021, also eliminated the health insurer tax. The Bipartisan Budget Act of 2018, or the BBA, among other things, amends the ACA, effective January 1, 2019, to close the coverage gap in most Medicare drug plans, commonly referred to as the “donut hole.” On December 14, 2018, a judge for the United States District Court for the Northern District of Texas ruled that the ACA is unconstitutional in its entirety because the “individual mandate” was repealed by Congress as part of the Tax Act. Additionally, on December 18, 2019, the United States Court of Appeals for the Fifth Circuit upheld the District Court ruling that the individual mandate was unconstitutional and remanded the case back to the District Court to determine whether the remaining provisions of the ACA are invalid as well. The U.S. Supreme Court has not yet ruled on the constitutionality of the ACA. On January 28, 2021, President Biden issued an executive order to initiate a special enrollment period from February 15, 2021 through May 15, 2021 for purposes of obtaining health insurance coverage through the ACA marketplace. The executive order also instructs certain governmental agencies to review and reconsider their existing policies and rules that limit access to healthcare, including among others, reexamining Medicaid demonstration projects and waiver programs that include work requirements, and policies that create unnecessary barriers to obtaining access to health insurance coverage through Medicaid or the ACA. It is unclear how the Supreme Court ruling, future decisions, subsequent appeals, and the healthcare reform measures of the Biden administration will impact the ACA and our business.

Other legislative changes have been proposed and adopted since the ACA was enacted. These changes include aggregate reductions to Medicare payments to providers of 2% per fiscal year pursuant to the Budget Control Act of 2011, which began in 2013 and, due to subsequent legislative amendments to the statute, including the BBA, will remain in effect through 2030 unless additional Congressional action is taken. However, COVID-19 relief legislation has temporarily suspended these reductions from May 1, 2020 through March 31, 2021. The American Taxpayer Relief Act of 2012, among other things, further reduced Medicare payments to several providers, including hospitals and cancer treatment centers and increased the statute of limitations period for the government to recover overpayments to providers from three to five years. These new laws may result in additional reductions in Medicare and other healthcare funding, which could have an adverse effect on customers for our product candidates, if approved, and, accordingly, our financial operations.

Additionally, there has been heightened governmental scrutiny in the United States of pharmaceutical pricing practices in light of the rising cost of prescription drugs and biologics. 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 used several means to propose or implement drug pricing reform, including through federal budget proposals, executive orders and policy initiatives. For example, on July 24, 2020 and September 13, 2020, the Trump administration announced several executive orders related to prescription drug pricing that seek to implement several of the administration's proposals. As a result, the FDA released a final rule on September 24, 2020, effective November 30, 2020, providing guidance for states to build and submit importation plans for drugs from Canada. Further, on November 20, 2020, the U.S. Department of Health and Human Services, or HHS, finalized a regulation removing safe harbor protection for price reductions from pharmaceutical manufacturers to plan sponsors under Medicare Part D, either directly or through pharmacy benefit managers, unless the price reduction is required by law. The implementation of the rule has been delayed by the Biden administration from January 1, 2022 to January 1, 2023 in response to ongoing litigation. The rule also creates a new safe harbor for price reductions reflected at the point-of-sale, as well as a new safe harbor for certain fixed fee arrangements between pharmacy benefit managers and manufacturers, the implementation of which have also been delayed pending review by the Biden administration until March 22, 2021. On November 20, 2020, CMS issued an interim final rule implementing the Trump administration's Most Favored Nation executive order, which would tie Medicare Part B payments for certain physician-administered drugs to the lowest price paid in other economically advanced countries, effective January 1, 2021. On December 28, 2020, the U.S. District Court in Northern California issued a nationwide preliminary injunction against implementation of the interim final rule. It is unclear whether the Biden administration will work to reverse these measures or pursue similar policy initiatives. 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.

Employees and Human Capital Resources

As of December 31, 2020, we had approximately 50 employees. All of our employees are located in the United States. None of our employees is represented by a labor union or covered by a collective bargaining agreement. We consider our relationship with our employees to be good.

Our human capital resources objectives include, as applicable, identifying, recruiting, retaining, incentivizing and integrating our existing and additional employees. The principal purposes of our equity incentive plans are to attract, retain and motivate selected employees, consultants and directors through granting of equity-based compensation awards.

Corporate Information

We were incorporated under the laws of the State of Delaware in January 2002. Our principal executive offices are located at 1 Great Valley Parkway, Suite 30, Malvern, Pennsylvania 19355. Our telephone number is (610) 981-6500. Our common stock is listed on the Nasdaq Global Market under the symbol "PHAS."

Available Information

Our internet website address is *www.phasebio.com*. In addition to the information contained in this Annual Report, information about us can be found on our website. Our website and information included in or linked to our website are not part of this Annual Report.

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 Securities Exchange Act of 1934, as amended, are available free of charge through our website as soon as reasonably practicable after they are electronically filed with or furnished to the Securities and Exchange Commission, or the SEC. The SEC maintains an internet site that contains reports, proxy and information statements and other information. The address of the SEC's website is *www.sec.gov*.

Item 1A. Risk Factors.

The following information sets forth risk factors that could cause our actual results to differ materially from those contained in forward-looking statements we have made in this Annual Report on Form 10-K and those we may make from time to time. You should carefully consider the risks described below, in addition to the other information contained in this Annual Report on Form 10-K and our other public filings. Our business, financial condition or results of operations could be harmed by any of these risks. The risks and uncertainties described below are not the only ones we face. Additional risks not presently known to us or other factors not perceived by us to present significant risks to our business at this time also may impair our business operations.

Summary of Risk Factors

Our business is subject to a number of risks of which you should be aware before making a decision to invest in our common stock. These risks are more fully described in this "Risk Factors" section, including the following:

- The ongoing COVID-19 pandemic is likely to adversely impact our business and operations, including our clinical trials.
- We have incurred significant losses since our inception. We expect to incur losses over the next several years and may never achieve or maintain profitability.
- We will need substantial additional funding to meet our financial obligations and to pursue our business objectives. If we are unable to raise capital when needed, we could be forced to curtail our planned operations and the pursuit of our growth strategy.
- The auditor's opinion on our audited financial statements for the fiscal year ended December 31, 2020 included in this Annual Report on Form 10-K contains an explanatory paragraph relating to our substantial doubt about our ability to continue as a going concern. Further, under the SFJ Agreement, SFJ may elect to have our business related to bentracimab transferred to SFJ if we do not remedy such going concern condition within the periods specified in the agreement and our ability to share in any revenues from the commercialization of bentracimab will be materially and adversely affected.
- If we receive regulatory approval for bentracimab, or if the SFJ Agreement is terminated, we will be required to make substantial payments to SFJ pursuant to the SFJ Agreement. If we do not have sufficient funding or cash flow from our business to meet our payment obligations under the SFJ Agreement, SFJ could exercise its remedies as a holder of a first-priority security interest in our assets and our business could be materially harmed.
- We currently have only two clinical-stage product candidates, bentracimab, a ticagrelor reversal agent, and pemziviptadil for the treatment of PAH. If we are unable to successfully develop, receive regulatory approval for and commercialize our product candidates for these or any other indications, or successfully develop any other product candidates, or experience significant delays in doing so, our business will be harmed.
- Based on feedback from the FDA, we intend to seek regulatory approval of bentracimab in the United States through an accelerated approval process. If we are not successful with this process, the development and commercialization of bentracimab could be delayed, abandoned or significantly more costly.
- Success in preclinical studies or earlier clinical trials may not be indicative of results in future clinical trials.
- As an organization, we have never completed pivotal clinical trials, and we may be unable to do so for any product candidates we may develop.
- ELP is a novel technology, which makes it difficult to predict the time, risks and cost of development and the ability to subsequently obtain regulatory approval of our ELP product candidates.
- We may not be successful in our efforts to increase our pipeline of product candidates, including by pursuing additional indications for our current product candidates or in-licensing or acquiring additional product candidates for other diseases.
- Market acceptance of bentracimab, if approved, will depend heavily on the continued market acceptance and use of ticagrelor.

- We contract with third parties for the manufacture of bentracimab and pemziviptadil for preclinical and clinical testing and expect to continue to do so for commercialization. This reliance on third parties increases the risk that we will not have sufficient quantities of our product candidates or such quantities at an acceptable cost, which could delay, prevent or impair our development or commercialization efforts.
- If we are unable to obtain or protect intellectual property rights related to any of our product candidates, we may not be able to compete effectively in our market.
- If we fail to comply with our obligations in our current and future intellectual property licenses and funding arrangements with third parties, we could lose rights that are important to our business.

Risks Related to Our Financial Position and Capital Needs

The ongoing COVID-19 pandemic is likely to adversely impact our business and operations, including our clinical trials.

Our business operations are likely to continue to be adversely affected by the effects of the ongoing COVID-19 pandemic, which was declared by the World Health Organization as a global pandemic. The U.S., state and local governments have imposed travel and other restrictions in order to reduce the spread of the disease, including state and local orders across the United States that, among other things, direct individuals to shelter at their places of residence, direct businesses and governmental agencies to cease non-essential operations at physical locations, prohibit certain non-essential gatherings and events and order cessation of non-essential travel. In response to public health directives and orders, we have implemented work-from-home policies for all employees.

We may experience disruptions due to the COVID-19 pandemic that could severely impact our business and clinical trials, including:

- delays, difficulties or a suspension in enrolling patients in our ongoing and planned clinical trials;
- delays, difficulties or a suspension in clinical site initiation, including difficulties in recruiting clinical site investigators and clinical site staff;
- interruptions in our ability to manufacture and deliver drug supply for trials;
- diversion of healthcare resources away from the conduct of clinical trials, including the diversion of hospitals serving as our clinical trial sites and hospital staff supporting the conduct of our clinical trials;
- interruption of key clinical trial activities, such as clinical trial site monitoring, and the ability or willingness of subjects to travel to trial sites due to limitations on travel imposed or recommended by federal or state governments, employers and others; and
- limitations in employee resources that would otherwise be focused on the conduct of our clinical trials, including because of sickness of employees or their families or the desire of employees to avoid contact with large groups of people.

For our clinical trials that are planned to be conducted at sites in countries that are experiencing heightened impact from COVID-19, in addition to the risks listed above, we may also experience the following adverse impacts:

- delays in receiving approvals from local regulatory authorities to initiate our planned clinical trials;
- delays in clinical sites receiving the supplies and materials needed to conduct our clinical trials;
- interruption in global shipping that may affect the transport of clinical trial materials, such as investigational drug product used in our clinical trials;
- changes in local regulations as part of a response to the COVID-19 outbreak which may require us to change the ways in which our clinical trials are conducted, which may result in unexpected costs, or to discontinue the clinical trials altogether;
- delays in necessary interactions with local regulators, ethics committees and other important agencies and contractors due to limitations in employee resources or forced furlough of government employees; and
- refusal of the FDA to accept data from clinical trials in these affected geographies.

As we advance our clinical programs for bentracimab and pemziviptadil with site activations and patient enrollment, we remain in close contact with our clinical research organizations, or CROs, clinical sites and suppliers to attempt to assess the impacts that COVID-19 may have on our clinical trials and current timelines and to consider whether we can

implement appropriate mitigating measures to help to lessen such impacts. At this time, however, we cannot currently fully forecast the scope of impacts that COVID-19 may have on our ability to initiate trial sites, enroll and assess patients, supply study drug and report trial results.

We have commenced our pivotal REVERSE-IT trial for bentracimab and are currently working to identify and initiate additional clinical sites for this study, although the COVID-19 pandemic continues to impact the pace of site initiation and patient enrollment, including the types of patients enrolling in the trial. We expect to complete enrollment of the first 100 patients in the REVERSE-IT trial in mid-2021, and are targeting to submit our BLA for bentracimab in mid-2022, although those timelines could be impacted by the continued scope and duration of the COVID-19 pandemic.

With respect to our pemziviptadil program, we have resumed enrollment of new patients in our Phase 2b clinical trial for the treatment of PAH after having previously paused enrollment temporarily as a precaution to minimize potential exposure of this patient population at high risk of serious illness from COVID-19. We are targeting to report the top-line results of this trial in the second half of 2021, although that timeline could be impacted by the continued scope and duration of the COVID-19 pandemic.

In addition, remote work policies, quarantines, shelter-in-place and similar government orders, shutdowns or other restrictions on the conduct of business operations related to the COVID-19 pandemic could negatively impact productivity, disrupt our ongoing research and development activities and impact our operations, the magnitude of which will depend, in part, on the length and severity of the restrictions and other limitations and their effect on our ability to conduct our business in the ordinary course. In addition, although our employees are accustomed to working remotely, changes in internal controls due to remote work arrangements could potentially result in control deficiencies in the preparation of our financial reports, which could be significant.

The spread of COVID-19, which has had a broad impact globally, may materially affect us economically. While the potential economic impact brought by, and the continued duration of, COVID-19 may be difficult to assess or predict, a continued and growing pandemic could result in significant disruption of global financial markets, reducing our ability to access capital, which could in the future negatively affect our liquidity. In addition, a recession or market correction resulting from the spread of COVID-19 could materially affect our business and the value of our common stock.

The global COVID-19 pandemic continues to rapidly evolve. The extent to which COVID-19 may impact our business and clinical trials will depend on future developments that are highly uncertain and cannot be predicted with confidence, such as the geographic distribution of the disease over time, the continued duration of the outbreak, travel restrictions and social distancing in the United States and other countries, business closures or business disruptions and the effectiveness of actions taken in the United States and other countries to contain and treat the disease, including the efficacy and availability of vaccines and antiviral agents against the disease. Accordingly, we do not yet know the full extent of potential delays or impacts on our business, our clinical and regulatory activities, healthcare systems or the global economy as a whole. However, these impacts could adversely affect our business, financial condition, results of operations and growth prospects.

In addition, to the extent the ongoing COVID-19 pandemic adversely affects our business and results of operations, it may also have the effect of heightening many of the other risks and uncertainties described in this “Risk Factors” section.

We have incurred significant losses since our inception. We expect to incur losses over the next several years and may never achieve or maintain profitability.

We are a clinical-stage biopharmaceutical company with a limited operating history.

Since our inception, we have incurred significant net losses. Our net loss was $98.6 million for the year ended December 31, 2020. As of December 31, 2020, we had an accumulated deficit of $260.7 million. We expect to continue to incur significant expenses and operating losses for the foreseeable future. Since inception, we have financed our operations primarily with proceeds raised in our initial public offering, private placements of convertible debt and convertible preferred stock and borrowings under our term loan. In future periods we expect SFJ to provide up to $72.9 million of funding pursuant to the SFJ Agreement, $30.0 million of which we are eligible to receive upon the achievement of specified milestones with respect to our clinical development of bentracimab. We have no products approved for commercialization and have never generated any revenue from product sales.

We have devoted substantially all of our financial resources and efforts to the development of our clinical and preclinical product candidates and our proprietary half-life extending elastin-like polypeptide, or ELP, technology, including conducting preclinical studies and clinical trials. We expect to continue to incur significant expenses and operating losses over the next several years. We expect that it could be several years, if ever, before we have a commercialized product. Our net losses may fluctuate significantly from quarter to quarter and year to year. We anticipate that our expenses will increase substantially as we:

- continue our ongoing clinical trials of bentracimab and pemziviptadil, as well as initiate and complete additional clinical trials, as needed;
- seek to expand our geographical reach through the SFJ Agreement and the corresponding clinical development support fees that we will incur;
- pursue regulatory approvals for bentracimab as a reversal agent for the antiplatelet drug ticagrelor and pemziviptadil for the treatment of PAH;
- develop PB6440 for treatment-resistant hypertension;
- seek to discover and develop additional clinical and preclinical product candidates;
- scale up our clinical and regulatory capabilities;
- establish a commercialization infrastructure and scale up external manufacturing and distribution capabilities to commercialize any product candidates for which we may obtain regulatory approval, including bentracimab and pemziviptadil;
- adapt our regulatory compliance efforts to incorporate requirements applicable to marketed products;
- maintain, expand and protect our intellectual property portfolio;
- hire additional clinical, manufacturing and scientific personnel;
- add operational, financial and management information systems and personnel, including personnel to support our product development and planned future commercialization efforts; and
- incur additional legal, accounting and other expenses in operating as a public company.

To become and remain profitable, we must succeed in developing and eventually commercializing product candidates that generate significant revenue. This will require us to be successful in a range of challenging activities, including completing preclinical testing and clinical trials of our product candidates, obtaining regulatory approval, and manufacturing, marketing and selling any product candidates for which we may obtain regulatory approval, as well as discovering and developing additional product candidates. 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 any revenue or revenue that is significant enough to achieve profitability.

Even if we 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, maintain our development efforts, obtain product approvals, diversify our offerings or continue our operations. A decline in the value of our company could also cause you to lose all or part of your investment.

We have a limited operating history and no history of commercializing products, which may make it difficult for an investor to evaluate the success of our business to date and to assess our future viability.

We commenced operations in 2002, and our operations to date have been largely focused on raising capital and developing our clinical and preclinical product candidates and our proprietary ELP half-life extending technology, including undertaking preclinical studies and conducting clinical trials. To date, we have not yet demonstrated our ability to successfully complete pivotal clinical trials, obtain regulatory approvals, manufacture a product on a commercial scale, or arrange for a third party to do so on our behalf, or conduct sales and marketing activities necessary for successful commercialization. Consequently, any predictions you make about our future success or viability may not be as accurate as they could be if we had a longer operating history or a history of successfully developing and commercializing products.

We may encounter unforeseen expenses, difficulties, complications, delays and other known or unknown factors in achieving our business objectives. We will need to develop commercial capabilities, and we may not be successful in doing so.

We will need substantial additional funding to meet our financial obligations and to pursue our business objectives. If we are unable to raise capital when needed, we could be forced to curtail our planned operations and the pursuit of our growth strategy.

Our operations have consumed substantial amounts of cash since inception. Identifying potential product candidates and conducting preclinical testing and clinical trials 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. We expect to continue to incur significant expenses and operating losses over the next several years as we complete our ongoing clinical trials of our product candidates, initiate future clinical trials of our product candidates, seek marketing approval for bentracimab as a ticagrelor reversal agent and pemziviptadil for the treatment of PAH, develop PB6440 for treatment-resistant hypertension and advance any of our other product candidates we may develop or otherwise acquire. In addition, our product candidates, if approved, may not achieve commercial success. Our revenue, if any, will be derived from sales of products that we do not expect to be commercially available for a number of years, if at all. If we obtain marketing approval for bentracimab, pemziviptadil, PB6440 or any other product candidates that we develop or otherwise acquire, we expect to incur significant commercialization expenses related to product sales, marketing, distribution and manufacturing. We also expect an increase in our expenses associated with creating additional infrastructure to support operations as a public company.

We have experienced net losses and negative cash flows from operations and, as of December 31, 2020, had an accumulated deficit of $260.7 million. We expect to continue to incur net losses for at least the next several years. As of December 31, 2020, we had cash and cash equivalents of $28.1 million. We believe that our existing cash and cash equivalents as of December 31, 2020, in addition to the $42.9 million of clinical trial costs and other expenses that we expect SFJ will fund or reimburse pursuant to the SFJ Agreement, will not be sufficient to fund our operating expenses and capital requirements for 12 months from the date of the issuance of the financial statements included in this Annual Report on Form 10-K. These factors raise substantial doubt about our ability to continue as a going concern. Our future capital requirements will depend on many factors, including:

- the progress and results of our ongoing and planned future clinical trials of bentracimab and pemziviptadil and our development of PB6440 and other preclinical programs;
- the timing and amount of any payments we receive under the SFJ Agreement, and our ability to comply with our capitalization requirements under the SFJ Agreement;
- the scope, progress, results and costs of preclinical development, laboratory testing and clinical trials for any future product candidates we may decide to pursue;
- the extent to which we develop, in-license or acquire other product candidates and technologies;
- the number and development requirements of other product candidates that we may pursue;
- the costs, timing and outcome of regulatory review of our product candidates;
- the costs and timing of future commercialization activities, including product manufacturing, marketing, sales and distribution, for any of our product candidates for which we receive marketing approval;
- the amount of revenues, if any, received from commercial sales of our product candidates for which we receive marketing approval;
- our ability to establish collaborations to commercialize pemziviptadil in the United States;
- our ability to establish collaborations to commercialize bentracimab, pemziviptadil, PB6440 or any of our other product candidates outside the United States; and
- the costs and timing of preparing, filing and prosecuting patent applications, maintaining and enforcing our intellectual property rights and defending any intellectual property-related claims.

We will require additional capital to commercialize bentracimab, pemziviptadil and PB6440. If we receive regulatory approval for any of these product candidates, we expect to incur significant commercialization expenses related to product manufacturing, sales, marketing and distribution depending on where we choose to commercialize. Additional funds may not be available on a timely basis, on favorable terms, or at all, and such funds, if raised, may not be sufficient to enable us to continue to implement our long-term business strategy. Further, our ability to raise additional capital may be adversely impacted by potential worsening global economic conditions and the recent disruptions to and volatility in the credit and financial markets in the United States and worldwide resulting from the ongoing COVID-19 pandemic. If we are unable to raise sufficient additional capital, we could be forced to curtail our planned operations and the pursuit of our growth strategy.

Raising additional capital may cause dilution to our stockholders, 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 revenue, we may finance our cash needs through a combination of equity offerings, government or private party grants, debt financings and license and collaboration agreements.

Except with respect to the funding obligations pursuant to the SFJ Agreement, we do not currently have any other committed external source of funds. 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. 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. For example, under the SFJ Agreement, we granted SFJ a first-priority security interest in all of our assets related to bentracimab, subject only to the lien of SVB and WestRiver, or the Lenders, for existing indebtedness to the Lenders. In connection with the grant of the security interest, we agreed to certain affirmative and negative covenants, including restrictions on our ability to pay dividends, incur additional debt or enter into licensing transactions with respect to intellectual property related to bentracimab. Similarly, our loan and security agreement with the Lenders is secured by a security interest in substantially all of our current and future assets. We are also obligated to comply with various other customary covenants, including restrictions on our ability to encumber our intellectual property assets. The security interests granted to SFJ and the Lenders may preclude future debt financing or make the terms of such financings less favorable.

If we raise additional funds through collaborations, strategic alliances or marketing, distribution or licensing arrangements with third parties, we may be required to relinquish valuable rights to our technologies, future revenue streams or product candidates, grant licenses on terms that may not be favorable to us or commit to future payment streams. 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 product candidates that we would otherwise prefer to develop and market ourselves.

The auditor's opinion on our audited financial statements for the fiscal year ended December 31, 2020 included in this Annual Report on Form 10-K contains an explanatory paragraph relating to our substantial doubt about our ability to continue as a going concern. Further, under the SFJ Agreement, SFJ may elect to have our business related to bentracimab transferred to SFJ if we do not remedy such going concern condition within the periods specified in the agreement and our ability to share in any revenues from the commercialization of bentracimab will be materially and adversely affected.

The auditor's opinion on our audited financial statements for the year ended December 31, 2020 included in this Annual Report on Form 10-K includes an explanatory paragraph stating that our recurring losses and negative cash flows from operations raise substantial doubt about our ability to continue as a going concern. Under the SFJ Agreement, if we fail to remedy such going concern condition during the periods specified in the agreement, SFJ may elect to have our business related to bentracimab transferred to SFJ. We have multiple quarters in which to remedy the going concern condition, including by restructuring our costs and operations, raising additional capital in financing or strategic transactions or accepting additional financing from SFJ on the same terms as their original commitment (which additional financing they have the option, but not obligation, to provide). Although we believe that the cure periods in the SFJ Agreement are sufficient to enable us to remedy the going concern condition, if we are unable to do so and if our business related to bentracimab is transferred to SFJ as a result, we will not share in any revenues from the commercialization of bentracimab until SFJ has received a 300% return on its investment in bentracimab, after which we will be entitled to a mid-single-digit royalty on net sales of bentracimab in the United States and certain European countries, and after SFJ has received an aggregate 500% return on its investment in bentracimab, we will be entitled to a mid-single-digit royalty on net sales of bentracimab in the rest of the world.

While we believe that we will be able to raise the capital we need to continue our operations and to remedy the going concern condition pursuant to the SFJ Agreement, there can be no assurances that we will be successful in these efforts or will be able to generate sufficient liquidity or eliminate our operating losses. If we are unable to obtain sufficient funding, we would need to significantly scale back our expenditures and thereby reduce our operating plans and curtail some or all of our product development, commercialization and strategic plans, and our ability to share in any revenues from the commercialization of bentracimab will be materially and adversely affected, each of which would similarly materially and adversely affect our business, prospects, financial condition and results of operations. If we are unable to 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 audited financial statements, and it is likely that investors will lose all or a part of their investment. 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.

If we receive regulatory approval for bentracimab, or if the SFJ Agreement is terminated, we will be required to make substantial payments to SFJ pursuant to the SFJ Agreement. If we do not have sufficient funding or cash flow from our

business to meet our payment obligations under the SFJ Agreement, SFJ could exercise its remedies as a holder of a first-priority security interest in our assets and our business could be materially harmed.

On January 9, 2020, we entered into the SFJ Agreement, pursuant to which SFJ agreed to provide up to $120.0 million to support the global development of bentracimab. If we receive regulatory approval for bentracimab as a reversal agent for the antiplatelet drug ticagrelor, we will be required to make substantial payments to SFJ pursuant to the SFJ Agreement. Our ability to make these required payments will depend on our future performance, which will be subject to economic, financial, competitive and other factors beyond our control. Our business may not generate cash flow from operations in the future sufficient to meet our obligations under the SFJ Agreement. If we are unable to generate such cash flow or to obtain additional funding through public or private equity offerings, debt financings, collaborations and licensing arrangements or other sources on acceptable terms or at all, we could default on our payment obligations to SFJ. We have granted SFJ a first-priority security interest in all of our assets related to bentracimab, subject only to the lien of the Lenders for existing indebtedness to the Lenders. If we are unable to meet our payment obligations to SFJ, SFJ may exercise its remedies as a holder of a first-priority security interest, which would result in a loss of our assets and our business would be materially harmed.

In addition, in the event that (i) we fail to pay any amounts payable to SFJ under the SFJ Agreement within a specified time period, (ii) we are in default of our obligations (subject to certain exclusions) under the MedImmune License or (iii) either (a) we determine it is probable that we will be unable to meet our obligations as they become due within one year after the date that our financial statements for the then-current quarter are issued, or available to be issued or (b) a "going concern" footnote is included in any of our financial statements, and, in either case ((a) or (b)), we fail to remedy such going concern condition as specified in the agreement, SFJ may elect to have our business related to bentracimab transferred to SFJ. We have multiple quarters in which to remedy the going concern condition, including by restructuring our costs and operations, raising additional capital in financing or strategic transactions or accepting additional financing from SFJ on the same terms as their original commitment (which additional financing they have the option, but not obligation, to provide). Although we believe that the cure periods in the SFJ Agreement are sufficient to enable us to remedy the going concern condition, if we are unable to do so and if our business related to bentracimab is transferred to SFJ, we will not share in any revenues from the commercialization of bentracimab until SFJ has received a 300% return on its investment in bentracimab, after which we will be entitled to a mid-single-digit royalty on net sales of bentracimab in the United States and certain European countries, and after SFJ has received an aggregate 500% return on its investment in bentracimab, we will be entitled to a mid-single-digit royalty on net sales of bentracimab in the rest of the world. See "—The auditor's opinion on our audited financial statements for the fiscal year ended December 31, 2020 included in this Annual Report on Form 10-K contains an explanatory paragraph relating to our substantial doubt about our ability to continue as a going concern. Further, under the SFJ Agreement, SFJ may elect to have our business related to bentracimab transferred to SFJ if we do not remedy such going concern condition within the periods specified in the agreement and our ability to share in any revenues from the commercialization of bentracimab will be materially and adversely affected."

In the event that the SFJ Agreement is terminated, we will be obligated to make substantial payments to SFJ. If following termination of the SFJ Agreement we continue to develop bentracimab and obtain BLA approval in the United States, the European Union, Japan or China, we will be obligated to pay applicable approval payments for any such jurisdiction to SFJ as if the SFJ Agreement had not been terminated, less any payments made upon termination, except in limited circumstances. Further, if our business related to SFJ is transferred to SFJ in the event that we breach certain provisions of the SFJ Agreement, we will not share in any revenues from the commercialization of bentracimab until SFJ has received an at least 300% return on its investment in bentracimab. See "Business - License, Co-Development and Other Agreements - Co-Development Agreement for bentracimab with SFJ Pharmaceuticals." Such payment obligations could have significant consequences for our stockholders and our business, results of operations and financial condition and could force us to delay or terminate development of bentracimab or other product candidates.

Risks Related to the Development of Our Product Candidates

We currently have only two clinical-stage product candidates, bentracimab, a ticagrelor reversal agent, and pemziviptadil for the treatment of PAH. If we are unable to successfully develop, receive regulatory approval for and commercialize our product candidates for these or any other indications, or successfully develop any other product candidates, or experience significant delays in doing so, our business will be harmed.

We currently have no products that are approved for commercial sale. We currently have only two clinical-stage product candidates, bentracimab and pemziviptadil. To date, we have not yet completed any pivotal clinical trials. We have not completed the development of any product candidates, and we may never be able to develop marketable products.

We have invested substantially all of our efforts and financial resources in the development of our clinical and preclinical product candidates and our proprietary ELP technology. Our ability to generate revenue from our product candidates, which we do not expect will occur for several years, if ever, will depend heavily on the successful development, regulatory approval and eventual commercialization of our product candidates. The success of bentracimab, pemziviptadil, PB6440 or any other product candidates that we develop or otherwise may acquire will depend on several factors, including:

- timely and successful completion of preclinical studies and clinical trials;
- sufficiency of our financial and other resources to complete the necessary preclinical studies and clinical trials;
- successful enrollment, including with respect to the various indications for which we might seek approval of bentracimab, and completion of clinical trials;
- with respect to bentracimab, the success of our collaboration with SFJ;
- successful development of, or making arrangements with third-party manufacturers for, our commercial manufacturing processes for any of our product candidates that receive regulatory approval;
- receipt of timely marketing approvals from applicable regulatory authorities;
- launching commercial sales of products, if approved;
- acceptance of our products, if approved, by patients, the medical community and third-party payors, for their approved indications;
- the prevalence and severity of adverse events experienced with bentracimab, pemziviptadil, PB6440 or any other product candidates;
- the availability, perceived advantages, cost, safety and efficacy of alternative therapies for any product candidate, and any indications for such product candidate, that we develop, specifically, alternative reversal agents or antiplatelet therapies to ticagrelor (including therapies that may be developed with a reversal agent), or alternative treatments for PAH or treatment-resistant hypertension;
- our ability to produce bentracimab, pemziviptadil, PB6440 or any other product candidates we develop on a commercial scale;
- obtaining and maintaining patent, trademark and trade secret protection and regulatory exclusivity for our product candidates and otherwise protecting our rights in our intellectual property portfolio;
- maintaining compliance with regulatory requirements, including current good manufacturing practices, or cGMPs, and complying effectively with other procedures; and
- maintaining a continued acceptable safety, tolerability and efficacy profile of the products following approval.

If we are not successful with respect to one or more of these factors in a timely manner or at all, we could experience significant delays or an inability to successfully commercialize the product candidates we develop, which would materially harm our business. If we do not receive marketing approvals for bentracimab, pemziviptadil, PB6440 or any other product candidate we develop, we may not be able to continue our operations.

The regulatory approval processes of the FDA and comparable foreign authorities are lengthy, time consuming and inherently unpredictable. If we are not able to obtain required regulatory approval for our product candidates, our business will be substantially harmed.

The time required to obtain approval or other marketing authorizations by the FDA and comparable foreign authorities is unpredictable, and it typically takes many years following the commencement of clinical trials and depends upon numerous factors, including the substantial discretion of the regulatory authorities. In addition, approval policies, regulations, and the type and amount of clinical data necessary to gain approval may change during the course of a product candidate's clinical development and may vary among jurisdictions. Bentracimab and pemziviptadil are currently our only clinical-stage product candidates. We have not obtained regulatory approval for any product candidate, and it is possible that we may never obtain regulatory approval for bentracimab, pemziviptadil, PB6440 or any product candidates we may seek to develop in the future. Neither we nor any current or future collaborator is permitted to market any drug product candidates in the United States until we receive regulatory approval of a BLA, or a new drug application, or NDA, from the FDA. To date, we have only had limited discussions with the EMA and other comparable foreign authorities regarding regulatory approval for bentracimab, pemziviptadil or any other product candidate outside of the United States.

Prior to obtaining approval to commercialize any drug product candidate in the United States or abroad, we must demonstrate with substantial evidence from well-controlled clinical trials, and to the satisfaction of the FDA or foreign regulatory agencies, that such product candidates are safe, pure and effective for their intended uses. Results from preclinical studies and clinical trials can be interpreted in different ways. Even if we believe the preclinical or clinical data for our product candidates are promising, such data may not be sufficient to support approval by the FDA and other regulatory authorities. The FDA may also require us to conduct additional preclinical studies or clinical trials for our product candidates either prior to or after approval, or it may object to elements of our clinical development programs.

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

We have invested a significant portion of our time and financial resources in the development of our clinical and preclinical product candidates, including bentracimab, pemziviptadil and PB6440. Our business is dependent on our ability to successfully complete preclinical and clinical development of, obtain regulatory approval for, and, if approved, successfully commercialize bentracimab, pemziviptadil, PB6440 and any future product candidates in a timely manner.

Even if we eventually complete clinical testing and receive approval of a BLA, NDA or foreign marketing application for bentracimab, pemziviptadil, PB6440 or any future product candidates, the FDA or the applicable foreign regulatory agency may grant approval or other marketing authorization contingent on the performance of costly additional clinical trials, including post-marketing clinical trials. The FDA or the applicable foreign regulatory agency also may approve or authorize for marketing a product candidate for a more limited indication or patient population than we originally request, and the FDA or applicable foreign regulatory agency may not approve or authorize the labeling that we believe is necessary or desirable for the successful commercialization of a product candidate. Any delay in obtaining, or inability to obtain, applicable regulatory approval or other marketing authorization would delay or prevent commercialization of that product candidate and would materially adversely impact our business and prospects.

In addition, the FDA and other regulatory authorities may change their policies, issue additional regulations or revise existing regulations, or take other actions, which may prevent or delay approval of our future products under development on a timely basis. Such policy or regulatory changes could impose additional requirements upon us that could delay our ability to obtain approvals, increase the costs of compliance or restrict our ability to maintain any marketing authorizations we may have obtained.

Based on feedback from the FDA, we intend to seek regulatory approval of bentracimab in the United States through an accelerated approval process. If we are not successful with this process, the development and commercialization of bentracimab could be delayed, abandoned or significantly more costly.

The FDA's accelerated approval regulations allow drugs that are being developed to treat an unmet medical need to be approved substantially based on evidence of an effect on a surrogate biomarker endpoint that is considered reasonably likely to predict clinical benefit, rather than a clinical endpoint such as survival or irreversible morbidity. Based on feedback from the FDA, our strategy is to use an accelerated approval pathway that may require that our REVERSE-IT trial of bentracimab be ongoing at the time of BLA approval. To support our BLA submission for accelerated approval, the FDA recommended an interim analysis of biomarker data from an initial subset of 100 patients, with approximately 50 patients with uncontrolled major or life-threatening bleeding and approximately 50 patients requiring urgent surgery or an invasive procedure, in our REVERSE-IT trial, together with safety data from our Phase 2 clinical trials. After we submit our BLA with data from the first 100 patients, we intend to complete the REVERSE-IT trial and establish a post-approval registry in accordance with FDA requirements. If the FDA requires the completion of the REVERSE-IT trial prior to the submission of a BLA, the development and commercialization timeline of bentracimab will be delayed. We may also experience an imbalance in the number and types of patients who enroll in the REVERSE-IT trial. We have enrolled more than half of the first approximately 100 patients needed to support our BLA submission, nearly all of whom to date have required urgent surgery or an invasive procedure. We are attempting to accelerate enrollment of patients with uncontrolled major or life-threatening bleeding, including by working to increase the number of enrolling clinical trial sites in the United States, Canada, and the European Union as we believe that a broader site footprint will increase the probability of enrolling these patients. All of the first approximately 100 patients enrolled in the REVERSE-IT trial will be measured against the same VerifyNow PRUTest biomarker. If we are unable to enroll a sufficient number of patients in this trial, including patients with uncontrolled major or life-threatening bleeding, the FDA may determine that the trials conducted by us were insufficient to support approval for all or

some of the proposed indications we intend to pursue. Further, the FDA may require us to conduct extensive post-approval studies or require us to make modifications to our ongoing REVERSE-IT trial after approval and marketing.

Clinical product development involves a lengthy and expensive process, with an uncertain outcome. We may incur additional costs and experience delays in completing, or ultimately be unable to complete, the development and commercialization of our product candidates.

In order to obtain FDA approval to market a new biological or drug product we must demonstrate proof of safety, purity and efficacy in humans. The risk of failure for product candidates is high. It is impossible to predict when or if any of our product candidates will prove effective or safe in humans or will receive regulatory approval. Before obtaining marketing approval from regulatory authorities for the sale of any product candidate, we must complete preclinical development and then conduct extensive clinical trials to demonstrate the safety, purity, potency, and efficacy of our product candidates in humans. Clinical testing is expensive, difficult to design and implement, can take many years to complete and is inherently uncertain as to outcome. A failure of one or more clinical trials can occur at any stage of testing or at any time during the trial process. The outcome of preclinical testing and early clinical trials may not be predictive of the results of later clinical trials, and interim results of a clinical trial do not necessarily predict final results. Moreover, preclinical and clinical data are often susceptible to varying interpretations and analyses, and many companies that have believed their product candidates performed satisfactorily in preclinical studies and clinical trials have nonetheless failed to obtain marketing approval of their products.

We have not completed all clinical trials required for the approval of any of our product candidates. We cannot assure you that any clinical trial that we are conducting, or may conduct in the future, will demonstrate consistent or adequate efficacy and safety to obtain regulatory approval to market our product candidates.

We may incur additional costs and experience delays in ongoing clinical trials for our product candidates, and we do not know whether future clinical trials, if any, will begin on time, need to be redesigned, enroll an adequate number of patients on time or be completed on schedule, if at all. We may experience numerous unforeseen events during or as a result of clinical trials that could delay or prevent our ability to receive marketing approval or commercialize our product candidates, including:

- regulators or institutional review boards may not authorize us or our investigators to commence a clinical trial or conduct a clinical trial at a prospective trial site;
- we may experience delays in reaching, or fail to reach, agreement on acceptable clinical trial contracts or clinical trial protocols with prospective trial sites or prospective CROs, the terms of which can be subject to extensive negotiation and may vary significantly among different CROs and trial sites;
- clinical trials of our product candidates may produce negative or inconclusive results, including failure to demonstrate statistical significance, and we may decide, or regulators may require us, to conduct additional clinical trials or abandon product development programs;
- the number of patients required for clinical trials of our product candidates may be larger than we anticipate, enrollment in these clinical trials may be slower than we anticipate or participants may drop out of these clinical trials or fail to return for post-treatment follow-up at a higher rate than we anticipate;
- our product candidates may have undesirable side effects or other unexpected characteristics, causing us or our investigators, regulators or institutional review boards to suspend or terminate the trials;
- our third-party contractors may fail to comply with regulatory requirements or meet their contractual obligations to us in a timely manner, or at all;
- regulators or institutional review boards may require that we or our investigators suspend or terminate clinical development for various reasons, including noncompliance with regulatory requirements or a finding that the participants are being exposed to unacceptable health risks;
- the cost of clinical trials of our product candidates may be greater than we anticipate; and
- the supply or quality of our product candidates or other materials necessary to conduct clinical trials of our product candidates may be insufficient or inadequate.

If we experience delays in the completion of any clinical trial of our product candidates or if any such trial is terminated, the commercial prospects of our product candidates will be harmed, and our ability to generate product revenues from any of these product candidates will be delayed. In addition, 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.

If we are required to conduct additional clinical trials or other testing of our product candidates beyond those that we currently contemplate, if we are unable to successfully complete clinical trials of our product candidates or other testing, if the results of these trials or tests are not favorable or if there are safety concerns, we may:

- be delayed in obtaining marketing approval for our product candidates;
- not obtain marketing approval at all;
- obtain approval for indications or patient populations that are not as broad as intended or desired;
- obtain approval with labeling that includes significant use or distribution restrictions or safety warnings;
- be subject to additional post-marketing testing requirements; or
- have the product removed from the market after obtaining marketing approval.

Success in preclinical studies or earlier clinical trials may not be indicative of results in future clinical trials.

Success in preclinical testing and early clinical trials does not ensure that later clinical trials will generate the same results or otherwise provide adequate data to demonstrate the efficacy and safety of a product candidate. Preclinical tests and Phase 1 and Phase 2 clinical trials are primarily designed to test safety, to study pharmacokinetics and pharmacodynamics and to understand the side effects of product candidates at various doses and schedules. Success in preclinical or animal studies and early clinical trials does not ensure that later large-scale efficacy trials will be successful nor does it predict final results. Our product candidates may fail to show the desired safety and efficacy in clinical development despite positive results in preclinical studies or having successfully advanced through initial clinical trials.

Many companies in the pharmaceutical and biotechnology industries have suffered significant setbacks in late-stage clinical trials even after achieving promising results in preclinical testing and earlier-stage clinical trials. Data obtained from preclinical and clinical activities are subject to varying interpretations, which may delay, limit or prevent regulatory approval. In addition, we may experience regulatory delays or rejections as a result of many factors, including changes in regulatory policy during the period of our product candidate development. Any such delays could negatively impact our business, financial condition, results of operations and prospects.

Interim "top-line" and preliminary results from our clinical trials that we 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 may publish interim top-line or preliminary results from our clinical trials. Interim results from clinical trials that we may complete 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. Preliminary or top-line results also remain subject to audit and verification procedures that may result in the final data being materially different from the preliminary data we previously published. As a result, interim and preliminary data should be viewed with caution until the final data are available. Differences between preliminary or interim data and final data could significantly harm our business prospects and may cause the trading price of our common stock to fluctuate significantly.

Our clinical trials may fail to demonstrate the safety and efficacy of our product candidates, or serious adverse or unacceptable side effects may be identified during the development of our product candidates, which could prevent or delay regulatory approval and commercialization, increase our costs or necessitate the abandonment or limitation of the development of some of our product candidates.

Before obtaining regulatory approvals for the commercial sale of our product candidates, we must demonstrate through lengthy, complex and expensive preclinical testing and clinical trials that our product candidates are safe, pure and effective for use in each target indication, and failures can occur at any stage of testing. Clinical trials often fail to demonstrate safety or efficacy of the product candidate studied for the target indication. Based on the health profile of our patient population, it is possible that we may experience a serious adverse event that could prevent or delay regulatory approval and commercialization, increase our costs or necessitate the abandonment or limitation of the development of some of our product candidates.

If our product candidates are associated with side effects in clinical trials or have characteristics that are unexpected, we may need to abandon their development or limit development to more narrow uses in which the side effects or other characteristics are less prevalent, less severe or more acceptable from a risk-benefit perspective. The FDA or an institutional review board may also require that we suspend, discontinue, or limit our clinical trials based on safety information, or that we conduct additional animal or human studies regarding the safety and efficacy of our product candidates which we have not planned or anticipated. Such findings could further result in regulatory authorities failing to provide marketing authorization for our product candidates or limiting the scope of the approved indication, if approved. Many product candidates that initially showed promise in early stage testing have later been found to cause side effects that prevented further development of the product candidate.

Additionally, if one or more of our product candidates receives marketing approval, and we or others identify undesirable side effects caused by such products, a number of potentially significant negative consequences could result, including:

- regulatory authorities may withdraw approvals of such product;
- regulatory authorities may require additional warnings on the labels;
- we may be required to create a medication guide outlining the risks of such side effects for distribution to patients;
- we could be sued and held liable for harm caused to patients;
- we may not be able to achieve or maintain third-party payor coverage and adequate reimbursement; and
- our reputation and physician or patient acceptance of our products may suffer.

There can be no assurance that we will resolve any issues related to any product-related adverse events to the satisfaction of the FDA or foreign regulatory agency in a timely manner or at all. Moreover, 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 an organization, we have never completed pivotal clinical trials, and we may be unable to do so for any product candidates we may develop.

We will need to successfully complete pivotal clinical trials in order to obtain the approval of the FDA, EMA or other regulatory agencies to market bentracimab, pemziviptadil, PB6440 or any future product candidate. Carrying out pivotal clinical trials is a complicated process. As an organization, we have not previously completed any later stage or pivotal clinical trials. In order to do so, we have needed to and will need to further expand our clinical development and regulatory capabilities, and we may be unable to recruit and train additional qualified personnel. We also expect to continue to rely on third parties to conduct our pivotal clinical trials. See "— Risks Related to our Dependence on Third Parties —We rely on third parties to conduct a significant portion of our existing clinical trials and potential future clinical trials for product candidates, and those third parties may not perform satisfactorily, including failing to meet deadlines for the completion of such trials." In particular, pursuant to the SFJ Agreement, SFJ will have primary responsibility for clinical development and regulatory activities for bentracimab in China and Japan and will provide clinical trials operational support in the European Union. Consequently, we may be unable to successfully and efficiently execute and complete necessary clinical trials in a way that leads to BLA or NDA submission and approval of bentracimab, pemziviptadil, PB6440 or 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 commercializing our product candidates.

If we experience delays or difficulties in the enrollment and/or maintenance of patients in clinical trials, our receipt of necessary regulatory approvals could be delayed or prevented.

Successful and timely completion of clinical trials will require that we enroll a sufficient number of patients. Patient enrollment, a significant factor in the timing of clinical trials, is affected by many factors, including the size and nature of the patient population. Trials may be subject to delays as a result of patient enrollment taking longer than anticipated or patient withdrawal. We may not be able to initiate or continue clinical trials for our product candidates if we are unable to locate and enroll a sufficient number of eligible patients to participate in these trials as required by the FDA or foreign regulatory authorities. We cannot predict how successful we will be at enrolling subjects in future clinical trials. Subject enrollment is affected by other factors including:

- the eligibility criteria for the trial in question;
- the size of the patient population and process for identifying patients;
- the perceived risks and benefits of the product candidate in the trial;
- the availability of competing commercially available therapies and other competing drug candidates' clinical trials;
- the willingness of patients to be enrolled in our clinical trials;
- the efforts to facilitate timely enrollment in clinical trials;
- potential disruptions caused by the COVID-19 pandemic, including difficulties in initiating clinical sites, enrolling and retaining participants, diversion of healthcare resources away from clinical trials, travel or quarantine policies that may be implemented, and other factors;
- the patient referral practices of physicians;
- the ability to monitor patients adequately during and after treatment; and
- the proximity and availability of clinical trial sites for prospective patients.

Our inability to enroll a sufficient number of patients for clinical trials would result in significant delays and could require us to abandon one or more clinical trials altogether. Enrollment delays in these clinical trials may result in increased development costs for our product candidates, which would cause the value of our company to decline and limit our ability to obtain additional financing. Furthermore, we rely on and expect to continue to rely on CROs and clinical trial sites to ensure the proper and timely conduct of our clinical trials and we will have limited influence over their performance.

Furthermore, even if we are able to enroll a sufficient number of patients for our clinical trials, we may have difficulty maintaining enrollment of such patients in our clinical trials.

Changes in methods of product candidate manufacturing or formulation may result in additional costs or delay.

As product candidates proceed through preclinical studies to late-stage clinical trials towards potential approval and commercialization, it is common that various aspects of the development program, such as manufacturing methods and formulation, are altered along the way in an effort to optimize processes and product characteristics. Such changes carry the risk that they will not achieve these intended objectives. Any of these changes could cause our product candidates to perform differently and affect the results of planned clinical trials or other future clinical trials conducted with the materials manufactured using altered processes. Such changes may also require additional testing, FDA notification or FDA approval. This could delay completion of clinical trials, require the conduct of bridging clinical trials or the repetition of one or more clinical trials, increase clinical trial costs, delay approval of our product candidates and jeopardize our ability to commence sales and generate revenue.

Our clinical development of bentracimab depends on the continued use of ticagrelor as an antiplatelet therapy.

We are developing bentracimab as a ticagrelor reversal agent for the treatment of patients on ticagrelor with uncontrolled major or life-threatening bleeding or requiring urgent surgery or an invasive procedure. If previously unknown safety risks related to ticagrelor are discovered that would affect its use as an antiplatelet therapy, or if market acceptance of ticagrelor significantly changes, we may pause or stop development of bentracimab, which would significantly and adversely affect our business prospects.

ELP is a novel technology, which makes it difficult to predict the time, risks and cost of development and of subsequently obtaining regulatory approval of our ELP product candidates.

Pemziviptadil and certain other preclinical product candidates are based on our proprietary ELP technology. Some of our future success depends on the successful development of this technology and products based on it. To our knowledge, no regulatory authority has granted approval to any person or entity, including us, to market and commercialize therapeutics using our novel ELP technology. We may never receive approval to market and commercialize any product candidate that utilizes ELP.

If we uncover any previously unknown risks related to our ELP technology, or if we experience unanticipated problems or delays in developing our ELP product candidates, we may be unable to complete our clinical trials and preclinical

studies, meet the obligations of our license agreements or commercialize our product candidates on a timely or profitable basis. If serious adverse events or unacceptable side effects are observed in clinical trials or preclinical studies of a product candidate based on our ELP technology, our ability to develop other product candidates based on our ELP technology would be adversely affected.

We may be unable to obtain or maintain orphan drug designations or exclusivity for pemziviptadil or other product candidates, which could limit the potential profitability of such product candidates.

Regulatory authorities in some jurisdictions, including the United States, designate drugs intended for relatively small patient populations as orphan drugs. Under the Orphan Drug Act, the FDA may grant orphan designation to a drug or biologic intended to treat a rare disease or condition, which is a disease or condition that affects fewer than 200,000 individuals in the United States, or more than 200,000 individuals in the United States for which there is no reasonable expectation that the cost of developing and making available in the United States a drug or biologic for this type of disease or condition will be recovered from sales in the United States for that drug or biologic. Generally, a product that has orphan drug designation and subsequently receives the first FDA approval for the disease for which it has such designation is entitled to orphan drug exclusive approval (or exclusivity), which means that the FDA may not approve any other applications, including a full BLA, to market the same drug or biologic for the same indication for seven years, except in limited circumstances, such as a showing of clinical superiority to the product with orphan drug exclusivity. A designated orphan drug may not receive orphan drug exclusivity if it is approved for a use that is broader than the indication for which it received orphan designation.

The FDA has granted two orphan drug designations for pemziviptadil: one for the treatment of PAH and a second for cardiomyopathy associated with DMD. We may seek orphan drug designation for future indications for pemziviptadil or for other product candidates. Even if we were to obtain orphan drug designation for a product candidate, we may not obtain orphan exclusivity and that exclusivity may not effectively protect the drug from the competition of different drugs for the same condition, which could be approved during the exclusivity period. Additionally, after an orphan drug is approved, the FDA could subsequently approve another application for the same drug for the same indication if the FDA concludes that the later drug is shown to be safer or more effective or makes a major contribution to patient care. Orphan drug exclusive marketing rights in the United States also may be lost if the FDA later determines that the request for designation was materially defective or if the manufacturer is unable to assure sufficient quantity of the drug to meet the needs of patients with the rare disease or condition. The failure to obtain an orphan drug designation for any product candidates we may develop, the inability to maintain that designation for the duration of the applicable period, or the inability to obtain or maintain orphan drug exclusivity could reduce our ability to make sufficient sales of the applicable product candidate to balance our expenses incurred to develop it, which would have a negative impact on our operational results and financial condition.

Breakthrough Therapy designation by the FDA and PRIME designation by the EMA for bentracimab, or any other product candidate, may not lead to a faster development or regulatory review or approval process, and it does not increase the likelihood that the product candidate will receive marketing approval.

We have received a Breakthrough Therapy designation for bentracimab for the reversal of ticagrelor's antiplatelet activity and may, in the future, apply for Breakthrough Therapy designation for other product candidates. A Breakthrough Therapy is defined as a product candidate that is intended, alone or in combination with one or more other drugs, to treat a serious or life-threatening disease or condition, and preliminary clinical evidence indicates that the product candidate may demonstrate substantial improvement over existing therapies on one or more clinically significant endpoints, such as substantial treatment effects observed early in clinical development. For product candidates that have been designated as Breakthrough Therapies, interaction and communication between the FDA and the sponsor of the trial can help to identify the most efficient path for clinical development while minimizing the number of patients placed in ineffective control regimens. Product candidates designated as breakthrough therapies by the FDA are also eligible for priority review if supported by clinical data at the time of the submission of the BLA.

Designation as a Breakthrough Therapy is within the discretion of the FDA. Accordingly, even if we believe that one of our product candidates meets the criteria for designation as a Breakthrough Therapy, the FDA may disagree and instead determine not to make such designation. In any event, the receipt of a Breakthrough Therapy designation for a product candidate may not result in a faster development process, review or approval compared to product candidates considered for approval under conventional FDA procedures and it would not assure ultimate approval by the FDA. In addition, even if one or more of our product candidates qualifies as a Breakthrough Therapy, the FDA may later decide that the product candidate no longer meets the conditions for qualification or it may decide that the time period for FDA review or approval will not be shortened.

Access to the PRIME initiative is granted by the EMA to support the development and accelerate the review of new therapies to treat patients with unmet medical need. The receipt of this access for a product candidate may not result in a faster development process, review or approval compared to products considered for approval under conventional EMA procedures and, in any event, does not assure ultimate approval by the EMA. In addition, even though bentracimab has been granted access to PRIME, the EMA may later decide that it no longer meets the conditions for such access.

We may not be successful in our efforts to increase our pipeline of product candidates, including by pursuing additional indications for our current product candidates or in-licensing or acquiring additional product candidates for other diseases.

A key element of our strategy is to build and expand our pipeline of product candidates, including by developing pemziviptadil for the treatment of other orphan conditions, and PB6440 for treatment-resistant hypertension and by identifying other product candidates using our ELP technology. In addition, we may in-license or acquire additional product candidates for other diseases. We may not be able to identify or develop product candidates that are safe, tolerable and effective. Even if we are successful in continuing to build our pipeline, the potential product candidates that we identify, in-license or acquire may not be suitable for clinical development, including as a result of their being shown to have harmful side effects or other characteristics that indicate that they are unlikely to be products that will receive marketing approval and achieve market acceptance.

We may expend our limited resources to pursue a particular product candidate or indication and fail to capitalize on product candidates or indications that may be more profitable or for which there is a greater likelihood of success.

Because we have limited financial and management resources, we focus on development programs and product candidates that we identify for specific indications. As such, we are currently primarily focused on the development of bentracimab as a ticagrelor reversal agent, pemziviptadil for the treatment of PAH and PB6440 for treatment-resistant hypertension. As a result, we may forego or delay pursuit of opportunities with other product candidates or for other indications for pemziviptadil that later prove to have greater commercial potential. Our resource allocation decisions may cause us to fail to capitalize on viable commercial products or profitable market opportunities. Our spending on current and future development programs and product candidates for specific indications may not yield any commercially viable products. If we do not accurately evaluate the commercial potential or target market for a particular product candidate, we may relinquish valuable rights to that product candidate through collaboration, licensing or other royalty arrangements in cases in which it would have been more advantageous for us to retain sole development and commercialization rights to such product candidate.

The United Kingdom's withdrawal from the European Union may adversely impact our ability to obtain regulatory approvals of our product candidates in the United Kingdom, result in restrictions or imposition of taxes and duties for importing our product candidates into the United Kingdom, and may require us to incur additional expenses in order to develop, manufacture and commercialize our product candidates in the United Kingdom.

Following the result of a referendum in 2016, the United Kingdom left the European Union on January 31, 2020, commonly referred to as Brexit. Pursuant to the formal withdrawal arrangements agreed to by the United Kingdom and the European Union, the United Kingdom was subject to a transition period until December 31, 2020, or the Transition Period, during which EU rules continued to apply. A trade and cooperation agreement, or the Trade and Cooperation Agreement, that outlines the future and trading relationship between the United Kingdom and the European Union was agreed to in December 2020.

Since a significant proportion of the regulatory framework in the United Kingdom applicable to our business and our product candidates is derived from EU directives and regulations, Brexit has had, and will continue to have, a material impact on the regulatory regime with respect to the development, manufacture, importation, approval and commercialization of our product candidates in the United Kingdom or the European Union. For example, Great Britain is no longer covered by the centralized procedures for obtaining EU-wide marketing authorizations from the EMA, and a separate marketing authorization will be required to market our product candidates in Great Britain. It is currently unclear whether the Medicines & Healthcare products Regulatory Agency in the United Kingdom is sufficiently prepared to handle the increased volume of marketing authorization applications that it is likely to receive. Any delay in obtaining, or an inability to obtain, any marketing approvals, as a result of Brexit or otherwise, would delay or prevent us from commercializing our product candidates in the United Kingdom and limit our ability to generate revenue in that territory. While the Trade and Cooperation Agreement provides for the tariff-free trade of medicinal products between the United Kingdom and the European Union, there may be additional non-tariff costs to such trade that did not exist prior to the end of the Transition Period. Further, should the United Kingdom diverge from the European Union from a regulatory perspective in relation to medicinal products, tariffs could be put into place in the future. We could therefore, both now and in the future, face significant additional expenses (when compared to prior to the end of the Transition Period) to operate our business, which could significantly and materially harm or delay our ability to generate

revenues or achieve profitability of our business. Any further changes in international trade, tariff and import/export regulations as a result of Brexit or otherwise may impose unexpected duty costs or other non-tariff barriers on us. These developments, or the perception that any of them could occur, may significantly reduce global trade and, in particular, trade between the impacted nations and the United Kingdom.

Risks Related to the Commercialization of Our Product Candidates

Market acceptance of bentracimab, if approved, will depend heavily on the continued market acceptance and use of ticagrelor.

The commercial success of bentracimab as a ticagrelor reversal agent, if approved, is dependent on the continued market acceptance and use of ticagrelor as an antiplatelet therapy. Ticagrelor competes against other commercially available antiplatelet therapies, including other $P2Y_{12}$ receptor antagonists, many of which are available as generic drugs and therefore significantly less expensive than ticagrelor. New antiplatelet therapies may also be developed in the future, including other $P2Y_{12}$ receptor antagonists and other antiplatelet therapies, which could also have reversal agents, that could displace ticagrelor as the American College of Cardiology, American Heart Association and European Society of Cardiology's preferred antiplatelet agent for acute coronary syndrome or otherwise reduce ticagrelor's market position. Any such changes in the market acceptance and use of ticagrelor would significantly harm our business, results of operations and prospects for bentracimab.

Even if any of our product candidates receive marketing approval, they may fail to achieve the degree of market acceptance by physicians, patients, third-party payors and others in the medical community necessary for commercial success.

If any of our product candidates receive marketing approval, they may nonetheless fail to gain sufficient market acceptance by physicians, patients, third-party payors and others in the medical community. If our product candidates do not achieve an adequate level of acceptance, we may not generate significant revenue and we may not become profitable. The degree of market acceptance of our product candidates, if approved for commercial sale, will depend on a number of factors, including:

- the efficacy, safety and potential advantages compared to alternative treatments;
- our ability to offer our products for sale at competitive prices;
- the convenience and ease of administration compared to alternative treatments;
- product labeling or product insert requirements of the FDA or foreign regulatory authorities, including any limitations or warnings contained in a product's approved labeling, including any black box warning;
- the willingness of the target patient population to try new treatments and of physicians to prescribe these treatments;
- our ability to hire and retain a sales force in the United States;
- the strength of marketing and distribution support;
- the availability of third-party coverage and adequate reimbursement for bentracimab, pemziviptadil, PB6440 and any other product candidates, once approved;
- the prevalence and severity of any side effects; and
- any restrictions on the use of our products together with other medications.

If we are unable to establish sales, marketing and distribution capabilities for bentracimab, pemziviptadil, PB6440 or any other product candidate that may receive regulatory approval, we may not be successful in commercializing those product candidates if and when they are approved.

We do not have sales or marketing infrastructure. To achieve commercial success for bentracimab, pemziviptadil, PB6440 or any other product candidate for which we may obtain marketing approval, we will need to establish a sales and marketing organization. In the future, we expect to build a focused sales and marketing infrastructure to market some of our product candidates in the United States, if and when they are approved. There are risks involved with establishing our own sales, marketing and distribution capabilities. For example, recruiting and training a sales force is expensive and time consuming and could delay any product launch. If the commercial launch of a product candidate for which we recruit a sales force and establish marketing capabilities is delayed or does not occur for any reason, we would have prematurely or

unnecessarily incurred these commercialization expenses. This may be costly, and our investment would be lost if we cannot retain or reposition our sales and marketing personnel.

Factors that may inhibit our efforts to market our products on our own include:

- our inability to recruit, train and retain adequate numbers of effective sales and marketing personnel;
- the inability of sales personnel to obtain access to physicians in order to educate physicians about our product candidates, once approved;
- the lack of complementary products to be offered by sales personnel, which may put us at a competitive disadvantage relative to companies with more extensive product lines; and
- unforeseen costs and expenses associated with creating an independent sales and marketing organization.

If we are unable to establish our own sales, marketing and distribution capabilities and are forced to enter into arrangements with, and rely on, third parties to perform these services, our revenue and our profitability, if any, are likely to be lower than if we had developed such capabilities ourselves. In addition, we may not be successful in entering into arrangements with third parties to sell, market and distribute our product candidates or may be unable to do so on terms that are favorable to us. 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 do not establish sales, marketing and distribution capabilities successfully, either on our own or in collaboration with third parties, we will not be successful in commercializing our product candidates.

We face substantial competition, which may result in a smaller than expected commercial opportunity and/or others discovering, developing or commercializing products before or more successfully than we do.

The life sciences industry is highly competitive. We face competition with respect to our current product candidates, and will face competition with respect to any product candidates that we may seek to develop or commercialize in the future, from many different sources, including major pharmaceutical and specialty pharmaceutical companies, compounding facilities, academic institutions and governmental agencies and public and private research institutions.

There are currently no other known reversal agents approved or in clinical development for ticagrelor or any other antiplatelet drugs. In the European Union, an extracorporeal whole blood purification adsorber device is available that may be useful for non-specific removal of ticagrelor during some cardiac procedures when used in conjunction with cardiopulmonary bypass. Upon approval, bentracimab would be the only therapeutic agent available for specific reversal of ticagrelor. There can be no assurance that competitors will not seek to develop a competing product. Moreover, the success of bentracimab, if approved, will be dependent on the continued success of ticagrelor. See "—Market acceptance of bentracimab, if approved, will depend heavily on the continued market acceptance and use of ticagrelor."

We are aware of several other products and product candidates as potential treatments for PAH that would compete with pemziviptadil. Although we anticipate that pemziviptadil may be used as a complement to patients' existing therapies, we expect to compete with existing treatments for PAH patients with Class II-IV symptoms that target the endothelin, nitric oxide and prostacyclin pathways, as well as any generic equivalents that may be developed. In addition to currently approved drugs within these classes, we are also aware of a number of PAH therapies in clinical development with which pemziviptadil would compete if approved.

In addition, we are aware of several other products and product candidates as potential treatments for treatment-resistant hypertension that could compete with PB6440. Although we anticipate that PB6440 may be used as a complement to patients' existing antihypertensive therapies, we expect to compete with existing generic treatments for hypertension that target the mineralocorticoid receptor. In addition to the currently approved mineralocorticoid receptor antagonists, eplerenone and spironolactone, we are also aware of a number of therapies in clinical development for the treatment of resistant hypertension with which PB6440 would compete if approved, including CIN-107, an aldosterone synthase inhibitor currently being evaluated by CinCor Pharma, Inc. in a Phase 2 clinical trial.

In addition, our commercial opportunity could be reduced or eliminated if our competitors develop and commercialize products that are safer or more effective, have fewer or less severe side effects, are more convenient or are less expensive than bentracimab, pemziviptadil, PB6440 or any other product 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 our product, which could result in our competitors establishing a strong market position before we are able to enter the market.

Many of the companies against which we are competing, or against which we may compete in the future, have significantly greater financial resources and expertise in research and development, manufacturing, preclinical testing, conducting clinical trials, obtaining regulatory approvals and marketing approved products than we do. Mergers and acquisitions in the pharmaceutical and biotechnology industries may result in even more resources being concentrated among a smaller number of our competitors. Smaller or early-stage companies may also prove to be significant competitors, particularly through collaborative arrangements with large and established companies. These competitors also compete with us in recruiting and retaining qualified scientific and management personnel and establishing clinical trial sites and patient registration for clinical trials, as well as in acquiring technologies complementary to, or that may be necessary for, our programs.

The success of bentracimab as a ticagrelor reversal agent, pemziviptadil for the treatment of PAH, PB6440 for treatment-resistant hypertension or any future product candidate will depend significantly on coverage and adequate reimbursement or the willingness of patients to pay for these procedures.

We believe our success depends on obtaining and maintaining coverage and adequate reimbursement for bentracimab as a ticagrelor reversal agent, pemziviptadil for the treatment of PAH, PB6440 for treatment-resistant hypertension and/or procedures utilizing bentracimab, pemziviptadil, PB6440 or any other product candidate, and the extent to which patients will be willing to pay out-of-pocket for such products and procedures, in the absence of reimbursement for all or part of the cost. Obtaining coverage and adequate reimbursement for our products may be particularly difficult because of the higher prices often associated with drugs administered under the supervision of a physician. Separate reimbursement for the product itself or the treatment or procedure in which our product is used may not be available. Even if the procedure using our product is covered, third-party payors, such as Medicare, Medicaid, managed care organizations, and private health insurers, may package the cost of the drug into the procedure payment and not separately reimburse the physician for the costs associated with our product. A decision by a third-party payor not to cover or separately reimburse for our products could reduce physician utilization of our products once approved. Additionally, in the United States, there is no uniform policy of coverage and reimbursement among third-party payors. Third-party payors often rely upon Medicare coverage policy and payment limitations in setting their own coverage and reimbursement policies. However, decisions regarding the extent of coverage and amount of reimbursement to be provided are made on a payor-by-payor basis. One payor's determination to provide coverage for a drug product does not assure that other payors will also provide coverage, and adequate reimbursement.

Third-party payors determine which products and procedures they will cover and establish reimbursement levels. Even if a third-party payor covers a particular product or procedure, the resulting reimbursement payment rates may not be adequate. Patients who are treated in-office for a medical condition generally rely on third-party payors to reimburse all or part of the costs associated with the procedure, including costs associated with products used during the procedure, and may be unwilling to undergo such procedures in the absence of such coverage and adequate reimbursement. Physicians may be unlikely to offer procedures for such treatment if they are not covered by insurance and may be unlikely to purchase and use our product candidates, if approved, for our stated indications unless coverage is provided and reimbursement is adequate.

Reimbursement by a third-party payor may depend upon a number of factors, including the third-party payor's determination that a procedure is safe, effective and medically necessary; appropriate for the specific patient; cost-effective; supported by peer-reviewed medical journals; included in clinical practice guidelines; and neither cosmetic, experimental, nor investigational.

Further, from time to time, typically on an annual basis, payment rates are updated and revised by third-party payors. An example of payment rate updates occurs in the Medicare program updates to physician payments, which is done on an annual basis. In the past, when the application of the formula resulted in lower payment, Congress has passed interim legislation to prevent the reductions. The Medicare Access and CHIP Reauthorization Act of 2015, or MACRA, ended the use of the statutory formula and introduced a merit-based incentive bonus program for Medicare physicians, also referred to as the Quality Payment Program. This program provides clinicians with two ways to participate, including through the Advanced Alternative Payment Models and the Merit-based Incentive Payment System. In November 2019, CMS issued a rule finalizing the changes to the Quality Payment Program. The full impact to overall physician reimbursement as a result of the introduction of the Quality Payment Program remains unclear. Any reduction in reimbursement from Medicare or other government programs may result in a similar reduction in payments from private payors. Any resulting decrease in payment under the merit-based reimbursement system may adversely affect our revenue and results of operations. In addition, the Medicare physician fee schedule has been adapted by some private payors into their plan-specific physician payment schedule. We cannot predict how pending and future healthcare legislation will impact our business, and any changes in coverage and reimbursement that further restricts coverage of our product candidates or lowers reimbursement for procedures using our products could harm our business.

Foreign governments also have their own healthcare reimbursement systems, which vary significantly by country and region, and we cannot be sure that coverage and adequate reimbursement will be made available with respect to the treatments in which our products are used under any foreign reimbursement system.

There can be no assurance that bentracimab, pemziviptadil, PB6440 or any other product candidate, if approved for sale in the United States or in other countries, will be considered medically reasonable and necessary, that it will be considered cost-effective by third-party payors, that coverage or an adequate level of reimbursement will be available or that reimbursement policies and practices in the United States and in foreign countries where our products are sold will not adversely affect our ability to sell our product candidates profitably, if they are approved for sale.

The market for bentracimab, pemziviptadil, PB6440 or any other product candidates may be smaller than we expect.

Our estimates of the potential market opportunity for bentracimab, pemziviptadil, PB6440 or any other product candidates include several key assumptions based on our industry knowledge, industry publications and third-party research reports. These assumptions include, for bentracimab, the number of patients on ticagrelor who will experience uncontrolled major or life-threatening bleeding or who will require urgent surgery or an invasive procedure; for pemziviptadil, the number of patients with PAH; and for PB6440, the number of patients with treatment-resistant hypertension, as well as the estimated reimbursement levels for each product candidate if approved. However, there can be no assurance that any of these assumptions are, or will remain, accurate. If the actual market for bentracimab, pemziviptadil, PB6440 or for any other product candidates we may develop is smaller than we expect, our revenues, if any, may be limited and it may be more difficult for us to achieve or maintain profitability.

Product liability lawsuits against us could cause us to incur substantial liabilities and to limit commercialization of any products that we may develop.

We face an inherent risk of product liability exposure related to the testing of our product candidates in human clinical trials and will face an even greater risk if we commercially sell any products that we may develop. If we cannot successfully defend ourselves against claims that our product candidates or drugs caused injuries, we will incur substantial liabilities. Regardless of merit or eventual outcome, liability claims may result in:

- decreased demand for any product candidates or drugs that we may develop;
- injury to our reputation and significant negative media attention;
- withdrawal of clinical trial participants;
- significant costs to defend the related litigation;
- substantial monetary awards paid to trial participants or patients;
- loss of revenue;
- reduced resources of our management to pursue our business strategy; and
- the inability to commercialize any products that we may develop.

We currently hold $10,000,000 in product liability insurance coverage in the aggregate, with a per incident limit of $10,000,000, which may not be adequate to cover all liabilities that we may incur. We may need to increase our insurance coverage as we expand our clinical trials or if we commence commercialization of our product candidates. Insurance coverage is increasingly expensive. We may not be able to maintain insurance coverage at a reasonable cost or in an amount adequate to satisfy any liability that may arise.

Risks Related to Our Dependence on Third Parties

We rely on third parties to conduct a significant portion of our existing clinical trials and potential future clinical trials for product candidates, and those third parties may not perform satisfactorily, including failing to meet deadlines for the completion of such trials.

To date, we have generally engaged CROs to conduct or assist in our ongoing clinical trials of bentracimab and pemziviptadil. We expect to engage CROs for future clinical trials for bentracimab, pemziviptadil, PB6440 or other product candidates that we may progress to clinical development. In addition, pursuant to the SFJ Agreement, SFJ will have primary responsibility for clinical development and regulatory activities for bentracimab in China and Japan and will provide clinical trials operational support in the European Union. We expect to continue to rely on third parties, including clinical data

management organizations, medical institutions and clinical investigators, to conduct these clinical trials. Any of these third parties may terminate their engagements with us, some in the event of an uncured material breach and some at any time for convenience. If any of our relationships with these third parties terminate, we may not be able to timely enter into arrangements with alternative third parties or to do so on commercially reasonable terms, if at all. Switching or adding CROs involves substantial 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 intend to carefully manage our relationships with our CROs, there can be no assurance that we will not encounter challenges or delays in the future or that these delays or challenges will not have a material adverse impact on our business, financial condition and prospects. Further, the performance of our CROs may also be interrupted by the ongoing COVID-19 pandemic, including due to travel or quarantine policies, heightened exposure of CRO staff who are healthcare providers to COVID-19 or prioritization of resources toward the pandemic.

In addition, any third parties conducting our clinical trials will not be our employees, and except for remedies available to us under our agreements with such third parties, we cannot control whether or not they devote sufficient time and resources to our clinical programs. If these third parties do not successfully carry out their contractual duties or obligations or meet expected deadlines, if they need to be replaced or if the quality or accuracy of the clinical data they obtain is compromised due to the failure to adhere to our clinical protocols, regulatory requirements or for other reasons, our clinical trials may be extended, delayed or terminated and we may not be able to obtain regulatory approval for or successfully commercialize our product candidates. Consequently, our results of operations and the commercial prospects for our product candidates would be harmed, our costs could increase substantially and our ability to generate revenue could be delayed significantly.

We rely on these parties for execution of our preclinical studies and clinical trials, and generally do not control their activities. Our reliance on these third parties for research and development activities will reduce our control over these activities but will not relieve us of our responsibilities. For example, we will remain responsible for ensuring that each of our clinical trials is conducted in accordance with the general investigational plan and protocols for the trial. Moreover, the FDA requires us to comply with standards, commonly referred to as good clinical practices, or GCPs, for conducting, recording and reporting the results of clinical trials to assure that data and reported results are credible and accurate and that the rights, integrity and confidentiality of trial participants are protected. We also are required to register ongoing clinical trials and post the results of completed clinical trials on a government-sponsored database, ClinicalTrials.gov, within specified timeframes. Failure to do so can result in fines, adverse publicity and civil and criminal sanctions. If we or any of our CROs or other third parties, including trial sites, fail to comply with applicable GCPs, the clinical data generated in our clinical trials may be deemed unreliable and the FDA, EMA or comparable foreign regulatory authorities may require us to perform additional clinical trials before approving our marketing applications. We cannot assure you that upon inspection by a given regulatory authority, such regulatory authority will determine that any of our clinical trials complies with GCP regulations. In addition, our clinical trials must be conducted with product produced under cGMP conditions. Our failure to comply with these regulations may require us to repeat clinical trials, which would delay the regulatory approval process.

In addition, principal investigators for our clinical trials may 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. The FDA may conclude that a financial relationship between us and a principal investigator has created a conflict of interest or otherwise affected interpretation of the trial. The FDA 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 and may ultimately lead to the denial of marketing approval of bentracimab, pemziviptadil, PB6440 or any other product candidates.

We also expect to rely on other third parties to store and distribute product supplies for our clinical trials. Any performance failure on the part of our distributors could delay clinical development or marketing approval of our product candidates or commercialization of our products, producing additional losses and depriving us of potential revenue.

We contract with third parties for the manufacture of bentracimab and pemziviptadil for clinical drug supply and expect to continue to do so for commercialization if approved. This reliance on third parties increases the risk that we will not have sufficient quantities of our product candidates or such quantities at an acceptable cost, which could delay, prevent or impair our development or commercialization efforts.

We do not have any cGMP manufacturing facilities. We currently rely, and expect to continue to rely, on third parties for the cGMP manufacture of bentracimab, pemziviptadil, PB6440 and any other product candidates that we may pursue, for clinical development as well as for commercial manufacture of bentracimab, pemziviptadil, PB6440 and any other product candidates which we may pursue, if we receive marketing approval. We also rely on a proprietary *E. coli* strain owned by Wacker Biotech GmbH, or Wacker, which we have licensed for the production of bentracimab. Our reliance on Wacker's *E.*

coli strain increases the risk that we will not have sufficient quantities of bentracimab or be able to obtain quantities at an acceptable cost or quality, which could delay, prevent or impair our ability to timely conduct our clinical trials or our other development or commercialization efforts.

With respect to bentracimab, to date we have only relied upon Wacker for manufacture of drug substance for use in our initial clinical trials. As we scale our manufacturing of bentracimab to meet potential commercial demand, if bentracimab is approved, we have initiated a technology transfer of our current manufacturing process for bentracimab to BioVectra Inc., or BioVectra, another cGMP contract manufacturer. We have engaged BioVectra to manufacture drug substance for our ongoing clinical trials and recently engaged BioVectra to manufacture commercial supply of bentracimab, if approved. We will need to perform analytical and other tests to demonstrate that the new materials produced by Wacker, BioVectra, or any other future third-party manufacturer that we engage, are comparable in all respects to the product utilized in our previous clinical trials. There is no assurance that any such product will pass the required comparability testing in a timely manner, or at all, that any other future third-party manufacturer that we engage will be successful in producing bentracimab or that any materials produced by Wacker, BioVectra or any other third-party manufacturer that we engage will have the same effect in patients that we have observed to date with respect to materials used in our previous clinical trials. Moreover, if supplies are interrupted or produced in poor yield or quality, it would materially harm our business. BioVectra will be required to scale up the manufacturing process to meet our future needs of bentracimab for later-stage clinical development and, if approved, commercialization. If BioVectra is unable to successfully scale up the manufacturing process, we would need to find alternative manufacturing facilities or an alternative manufacturing process, which we may not be able to do on a timely basis or on commercially reasonable terms, if at all, and which could adversely affect the clinical development of bentracimab.

We also expect to rely on third-party manufacturers or third-party collaborators for the manufacture of commercial supply of bentracimab, pemziviptadil, PB6440 and any other product candidates for which we obtain marketing approval. The facilities used by our contract manufacturers to manufacture our product candidates must be inspected by the FDA or other regulatory authorities after we submit our BLA or comparable marketing application to the FDA or other regulatory authority. We do not have control over a supplier's or manufacturer's compliance with laws, regulations and applicable cGMP standards or similar regulatory requirements and other laws and regulations, such as those related to environmental health and safety matters. If our contract manufacturers cannot successfully manufacture material that conforms to our specifications and the strict regulatory requirements of the FDA or other regulatory authorities, we may be unable to obtain regulatory approval of our marketing applications. In addition, we have no control over the ability of our contract manufacturers to maintain adequate quality control, quality assurance and qualified personnel. If the FDA or a comparable foreign regulatory authority finds deficiencies with or does not approve these facilities for the manufacture of our product candidates 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 our product candidates, if approved.

We may be unable to enter into any agreements with future third-party manufacturers or to do so on acceptable terms. Even if we enter into such agreements, qualifying and validating such manufacturers may take a significant period of time and reliance on third-party manufacturers entails additional risks, including:

- reliance on the third party for regulatory compliance and quality assurance;
- the possible breach of the manufacturing agreement by the third party;
- the incurrence of upfront scale-up costs prior to commercial approval;
- the possible misappropriation of our proprietary information, including our trade secrets and know-how;
- the possible increase in costs for the raw materials for our product candidates; and
- the possible termination or nonrenewal of any agreement by any third party at a time that is costly or inconvenient for us.

Our failure, or the failure of our third-party manufacturers, 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, license revocation, seizures or recalls of product candidates or drugs, operating restrictions and criminal prosecutions, any of which could significantly and adversely affect supply of our products.

Our product candidates, and any drugs that we may develop, may compete with other product candidates and drugs for access to manufacturing facilities. The performance of our third-party manufacturers may also be interrupted by production shortages or other supply interruptions resulting from the ongoing COVID-19 pandemic. There are no assurances we would be able to enter into similar commercial arrangements with other manufacturers that operate under cGMP regulations

and that might be capable of manufacturing for us in a timely manner. Any performance failure on the part of our existing or future manufacturers could delay clinical development or marketing approval.

We are collaborating with SFJ for the development of bentracimab, and we may seek additional collaborations with third parties for the development or commercialization of our product candidates. If those collaborations are not successful, we may not be able to capitalize on the market potential of these product candidates.

We are collaborating with SFJ for the development of bentracimab. We may seek additional third-party collaborators for the development and commercialization of our product candidates, including for the commercialization of any of our product candidates that are approved for marketing outside the United States. Our likely collaborators for any such arrangements include regional and national pharmaceutical companies and biotechnology companies. If we enter into any additional such arrangements with any third parties, we will likely have limited control over the amount and timing of resources that our collaborators dedicate to the development or commercialization of our product candidates. Our ability to generate revenue from these arrangements will depend on our collaborators' abilities to successfully perform the functions assigned to them in these arrangements.

Collaborations involving our product candidates would pose the following risks to us:

- collaborators have significant discretion in determining the efforts and resources that they will apply to these collaborations;
- collaborators may not perform their obligations as expected;
- collaborators may not pursue development and commercialization of any product candidates that achieve regulatory approval or may elect not to continue or renew development or commercialization programs based on clinical trial results, changes in the collaborators' strategic focus or available funding, or external factors, such as an acquisition, that divert resources or create competing priorities;
- collaborators may delay clinical trials, provide insufficient funding for a clinical trial program, stop a clinical trial or abandon a product candidate, repeat or conduct new clinical trials or require a new formulation of a product candidate for clinical testing;
- collaborators could independently develop, or develop with third parties, products that compete directly or indirectly with our product candidates if the collaborators believe that competitive products are more likely to be successfully developed or can be commercialized under terms that are more economically attractive than ours;
- product candidates discovered in collaboration with us may be viewed by our collaborators as competitive with their own product candidates or drugs, which may cause collaborators to cease to devote resources to the commercialization of our product candidates;
- a collaborator with marketing and distribution rights to one or more of our product candidates that achieve regulatory approval may not commit sufficient resources to the marketing and distribution of such products;
- disagreements with collaborators, including disagreements over proprietary rights, contract interpretation or the preferred course of development, might cause delays or termination of the research, development or commercialization of product candidates, might lead to additional responsibilities for us with respect to product candidates, or might result in litigation or arbitration, any of which would be time-consuming and expensive;
- collaborators may not properly maintain or defend our or their intellectual property rights or may use our or their proprietary information in such a way as to invite litigation that could jeopardize or invalidate such intellectual property or proprietary information or expose us to potential litigation;
- collaborators may infringe the intellectual property rights of third parties, which may expose us to litigation and potential liability; and
- collaborations may be terminated for the convenience of the collaborator and, if terminated, we could be required to raise additional capital to pursue further development or commercialization of the applicable product candidates.

Collaboration agreements may not lead to development or commercialization of product candidates in the most efficient manner or at all. If SFJ or any future collaborator of ours were to be involved in a business combination, the continued pursuit and emphasis on our product development or commercialization program could be delayed, diminished or terminated.

We may seek to establish additional collaborations, and if we are unable to do so, we may have to alter our development and commercialization plans.

Our product development programs and the potential commercialization of our product candidates will require substantial additional capital. We are collaborating with SFJ for the development of bentracimab. For our other product candidates, we may decide to establish additional collaborations with pharmaceutical and biotechnology companies for the development and potential commercialization of those product candidates.

We face significant competition in seeking appropriate collaborators. Whether we reach a definitive agreement for any collaboration will depend, among other things, upon our assessment of the collaborator's resources and expertise, the terms and conditions of the proposed collaboration and the proposed collaborator's evaluation of a number of factors. Those factors may include the design or results of clinical trials, the likelihood of approval by the FDA or similar regulatory authorities outside the United States, the potential market for the subject product candidate, the costs and complexities of manufacturing and delivering such product candidate to patients, the potential of competing products, the existence of uncertainty with respect to our ownership of technology, which can exist if there is a challenge to such ownership without regard to the merits of the challenge and industry and market conditions generally. The collaborator may also consider alternative product candidates or technologies for similar indications that may be available to collaborate on and whether such a collaboration could be more attractive than the one with us for our product candidate. Collaborations are complex and time-consuming to negotiate and document. In addition, there have been a significant number of recent business combinations among large pharmaceutical companies that have resulted in a reduced number of potential future collaborators.

We may not be able to negotiate additional collaborations on a timely basis, on acceptable terms, or at all. If we are unable to do so, we may have to curtail the development of such product candidate, reduce or delay its development program or one or more of our other development programs, delay its potential commercialization or reduce the scope of any sales or marketing activities, or increase our expenditures and undertake development or commercialization activities at our own expense. If we elect to increase our expenditures to fund development or commercialization activities on our own, we may need to obtain additional capital, which may not be available to us on acceptable terms or at all. If we do not have sufficient funds, we may not be able to further develop our product candidates or bring them to market and generate revenue.

Risks Related to Our Intellectual Property

If we are unable to obtain or protect intellectual property rights related to any of our product candidates, we may not be able to compete effectively in our market.

We rely upon a combination of patents, trade secret protection and confidentiality agreements to protect the intellectual property related to our product candidates and our ELP technology. Our success depends in large part on our ability to obtain and maintain patent and other intellectual property protection in the United States and in other countries with respect to our proprietary technology and product candidates.

As of the date of this Annual Report on Form 10-K, our patent estate contained at least 22 patent families that we own or in-license that protect various aspects of our product candidates or our ELP technology platform. We own or have rights in 24 United States patents, 15 United States patent applications, 107 foreign patents and 64 foreign patent applications. We cannot offer any assurances about which of our patent applications will issue, the breadth of any resulting patent or whether any of the issued patents will be found invalid and unenforceable or will be threatened by third parties. We cannot offer any assurances that the breadth of our granted patents will be sufficient to stop a competitor from developing and commercializing a product, including a biosimilar product that would be competitive with one or more of our product candidates. Furthermore, any successful challenge to these patents or any other patents owned by or licensed to us after patent issuance could deprive us of rights necessary for the successful commercialization of any of our product candidates. Further, if we encounter delays in regulatory approvals, the period of time during which we could market a product candidate under patent protection could be reduced.

The patent prosecution process is expensive and time-consuming. We may not be able to prepare, file and prosecute all necessary or desirable patent applications at a commercially reasonable cost or in a timely manner or in all jurisdictions. It is also possible that we may fail to identify patentable aspects of inventions made in the course of development and commercialization activities before it is too late to obtain patent protection on them. Moreover, depending on the terms of

any future in-licenses to which we may become a party, we may not have the right to control the preparation, filing and prosecution of patent applications, or to maintain the patents, covering technology in-licensed from third parties. Therefore, these patents and patent applications may not be prosecuted and enforced in a manner consistent with the best interests of our business.

In addition to the protection provided by our patent estate, we rely on trade secret protection and confidentiality agreements to protect proprietary know-how that is not amenable to patent protection. Although we generally require all of our employees to assign their inventions to us, and all of our employees, consultants, advisors and any third parties who have access to our proprietary know-how, information, or technology to enter into confidentiality agreements, we cannot provide any assurances that all such agreements have been duly executed, or that our trade secrets and other confidential proprietary information will not be disclosed. Moreover, our competitors may independently develop knowledge, methods and know-how equivalent to our trade secrets. Competitors could purchase our products, if approved, and replicate some or all of the competitive advantages we derive from our development efforts for technologies on which we do not have patent protection. If any of our trade secrets were to be lawfully obtained or independently developed by a competitor, we would have no right to prevent them, or those to whom they communicate it, from using that technology or information to compete with us. If any of our trade secrets were to be disclosed to or independently developed by a competitor, our competitive position would be harmed.

We also seek to preserve the integrity and confidentiality of our data and trade secrets by maintaining physical security of our premises and physical and electronic security of our information technology systems. While we have confidence in these individuals, organizations and systems, our agreements or security measures may be breached, and we may not have adequate remedies for any breach. Also, if the steps taken to maintain our trade secrets are deemed inadequate, we may have insufficient recourse against third parties for misappropriating the trade secret. In addition, others may independently discover our trade secrets and proprietary information. For example, the FDA is considering whether to make additional information publicly available on a routine basis, including information that we may consider to be trade secrets or other proprietary information, and it is not clear at the present time how the FDA's disclosure policies may change in the future. If we are unable to prevent material disclosure of the non-patented intellectual property related to our technologies to third parties, and there is no guarantee that we will have any such enforceable trade secret protection, we may not be able to establish or maintain a competitive advantage in our market, which could materially adversely affect our business, results of operations and financial condition.

Patent terms may be inadequate to protect our competitive position on our products for an adequate amount of time, and if we do not obtain protection under the Hatch-Waxman Amendments and similar non-United States legislation for extending the term of patents covering each of our product candidates, our business may be materially harmed.

Given the amount of time required for the development, testing and regulatory review of new product candidates, patents protecting such candidates might expire before or shortly after such candidates are commercialized. Depending upon the timing, duration and conditions of FDA marketing approval of our product candidates, one or more of our United States patents may be eligible for limited patent term extension under the Drug Price Competition and Patent Term Restoration Act of 1984, referred to as the Hatch-Waxman Amendments, and similar legislation in the European Union. The Hatch-Waxman Amendments permit a patent term extension of up to five years for a patent covering an approved product as compensation for effective patent term lost during product development and 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. Only one patent may be extended, and only those claims covering the approved drug, a method for using it, or a method for manufacturing it may be extended. However, we may not receive an extension if we fail to apply within applicable deadlines, fail to apply prior to expiration of relevant patents or otherwise fail to satisfy applicable requirements. Moreover, the length of the extension could be less than we request. If we are unable to obtain patent term extension or the term of any such extension is less than we request, the period during which we can enforce our patent rights for that product will be shortened and our competitors may obtain approval to market competing products sooner. As a result, our revenue from applicable products could be reduced and could have a material adverse effect on our business.

If we fail to comply with our obligations in our current and future intellectual property licenses with third parties or the SFJ Agreement, we could lose rights that are important to our business.

We are heavily reliant upon licenses to certain patent rights and proprietary technology for the development of bentracimab, pemziviptadil and our ELP technology. These license agreements impose diligence, development and commercialization timelines and milestone payment, royalty, insurance and other obligations on us. If we fail to comply with our obligations, our licensors may have the right to terminate our licenses, in which event we might not be able to develop,

manufacture or market any product that is covered by the intellectual property we in-license from such licensor and may face other penalties. Such an occurrence would materially adversely affect our business prospects.

Licenses to additional third-party technology and materials that may be required for our development programs may not be available in the future or may not be available on commercially reasonable terms, or at all, which could have a material adverse effect on our business and financial condition. Although we control the prosecution, maintenance and enforcement of the licensed and sublicensed intellectual property relating to bentracimab, we may require the cooperation of our licensors and any upstream licensor, which may not be forthcoming. Therefore, we cannot be certain that the prosecution, maintenance and enforcement of these patent rights will be in a manner consistent with the best interests of our business. If we or our licensor fail to maintain such patents, or if we or our licensor lose rights to those patents or patent applications, the rights we have licensed may be reduced or eliminated and our right to develop and commercialize any of our product candidates that are the subject of such licensed rights could be adversely affected. In addition to the foregoing, the risks associated with patent rights that we license from third parties will also apply to patent rights we may own in the future. Further, if we fail to comply with our development obligations under our license agreements, we may lose our patent rights with respect to such agreement on a territory-by-territory basis, which would affect our patent rights worldwide.

Termination of our current or any future license agreements would reduce or eliminate our rights under these agreements and may result in our having to negotiate new or reinstated agreements with less favorable terms or cause us to lose our rights under these agreements, including our rights to important intellectual property or technology. Any of the foregoing could prevent us from commercializing our other product candidates, which could have a material adverse effect on our operating results and overall financial condition.

In addition, intellectual property rights that we in-license in the future may be sublicenses under intellectual property owned by third parties, in some cases through multiple tiers. The actions of our licensors may therefore affect our rights to use our sublicensed intellectual property, even if we are in compliance with all of the obligations under our license agreements. Should our licensors or any of the upstream licensors fail to comply with their obligations under the agreements pursuant to which they obtain the rights that are sublicensed to us, or should such agreements be terminated or amended, our ability to develop and commercialize our product candidates may be materially harmed.

Further, we have granted SFJ a security interest in all of our assets related to bentracimab, pursuant to the SFJ Agreement. If we are unable to meet our payment obligations to SFJ, SFJ may exercise its remedies as a holder of a first priority security interest, which would result in a loss of our bentracimab intellectual property rights and our business would be materially harmed.

Patent reform legislation could increase the uncertainties and costs surrounding the prosecution of our patent applications and the enforcement or defense of our future patents.

Our ability to obtain patents is highly uncertain because, to date, some legal principles remain unresolved, and there has not been a consistent policy regarding the breadth or interpretation of claims allowed in patents in the United States. Furthermore, the specific content of patents and patent applications that are necessary to support and interpret patent claims is highly uncertain due to the complex nature of the relevant legal, scientific, and factual issues. Changes in either patent laws or interpretations of patent laws in the United States and other countries may diminish the value of our intellectual property or narrow the scope of our patent protection.

For example, on September 16, 2011, the Leahy-Smith America Invents Act, or the Leahy-Smith Act, was signed into law. The Leahy-Smith Act included a number of significant changes to United States patent law. These included provisions that affect the way patent applications will be prosecuted and may also affect patent litigation. The United States Patent and Trademark Office, or USPTO, has developed new and untested regulations and procedures to govern the full implementation of the Leahy-Smith Act, and many of the substantive changes to patent law associated with the Leahy-Smith Act, and in particular, the first to file provisions, became effective in March 2013. The Leahy-Smith Act has also introduced procedures making it easier for third parties to challenge issued patents, as well as to intervene in the prosecution of patent applications. Finally, the Leahy-Smith Act contained new statutory provisions that require the USPTO to issue new regulations for their implementation, and it may take the courts years to interpret the provisions of the new statute. It is too early to tell what, if any, impact the Leahy-Smith Act will have on the operation of our business and the protection and enforcement of our intellectual property. However, the Leahy-Smith Act and its implementation could increase the uncertainties and costs surrounding the prosecution of our patent applications and the enforcement or defense of our future patents. Further, the United States 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 actions by the United States Congress, the federal courts and the USPTO, the laws and regulations governing patents could change in unpredictable ways that would weaken our ability to obtain new patents or to enforce patents that we have owned or licensed or that we might obtain in the future. An inability to obtain, enforce, and defend patents covering our proprietary technologies would materially and adversely affect our business prospects and financial condition.

Similarly, changes in patent laws and regulations in other countries or jurisdictions, changes in the governmental bodies that enforce them or changes in how the relevant governmental authority enforces patent laws or regulations may weaken our ability to obtain new patents or to enforce patents that we may obtain in the future. Further, the laws of some foreign countries do not protect proprietary rights to the same extent or in the same manner as the laws of the United States. As a result, we may encounter significant problems in protecting and defending our intellectual property both in the United States and abroad. For example, if the issuance in a given country of a patent covering an invention is not followed by the issuance in other countries of patents covering the same invention, or if any judicial interpretation of the validity, enforceability or scope of the claims or the written description or enablement, in a patent issued in one country is not similar to the interpretation given to the corresponding patent issued in another country, our ability to protect our intellectual property in those countries may be limited. Changes in either patent laws or in interpretations of patent laws in the United States and other countries may materially diminish the value of our intellectual property or narrow the scope of our patent protection.

We may be involved in lawsuits to protect or enforce our patents, which could be expensive, time consuming and unsuccessful.

Competitors may infringe the patents we have applied for. To counter infringement or unauthorized use, we may be required to file infringement claims, which can be expensive and time-consuming. If we initiate legal proceedings against a third party to enforce a patent covering one of our product candidates, the defendant could counterclaim that the patent covering our product or product candidate is invalid and/or unenforceable. In patent litigation in the United States, counterclaims alleging invalidity and/or unenforceability are common, and there are numerous grounds upon which a third party can assert invalidity or unenforceability of a patent. In an infringement proceeding, a court may decide that the patent claims we are asserting are invalid and/or unenforceable, or may refuse to stop the other party from using the technology at issue on the grounds that our patent claims do not cover the technology in question. Third parties may also raise similar claims before administrative bodies in the United States or abroad, even outside the context of litigation. Such mechanisms include re-examination, post grant review, *inter partes* review and equivalent proceedings in foreign jurisdictions (for example, opposition proceedings). Such proceedings could result in revocation of or amendment to our patents in such a way that they no longer cover our product candidates. 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, our patent counsel, and the patent examiner were unaware 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 our product candidates. An adverse result in any litigation or defense proceedings could put one or more of our patents at risk of being invalidated or interpreted narrowly, could put our patent applications at risk of not issuing and could have a material adverse impact on our business.

Interference proceedings provoked by third parties or brought by us may be necessary to determine the priority of inventions with respect to our patent applications. An unfavorable outcome could require us to cease using the related technology or force us to take a license under the patent rights of the prevailing party, if available. Furthermore, our business could be harmed if the prevailing party does not offer us a license on commercially reasonable terms. Our defense of litigation or interference proceedings may fail and, even if successful, may result in substantial costs and distract our management and other employees. We may not be able to prevent misappropriation of our intellectual property rights, particularly in countries where the laws may not protect those rights as fully as in the United States.

Furthermore, because of the substantial amount of discovery required in connection with intellectual property litigation, there is a risk that some of our confidential information could be compromised by disclosure during this type of litigation. There could also be public announcements of the results of hearings, motions, or other interim proceedings or developments. If securities analysts or investors perceive these results to be negative, it could have a material adverse effect on the price of our common stock.

We may be unsuccessful in licensing or acquiring intellectual property from third parties that may be required to develop and commercialize our product candidates.

A third party may hold intellectual property, including patent rights that are important or necessary to the development and commercialization of our product candidates. It may be necessary for us to use the patented or proprietary technology of third parties to commercialize our product candidates, in which case we would be required to acquire or obtain a license to such intellectual property from these third parties, and we may be unable to do so on commercially reasonable terms

or at all. The licensing or acquisition of third-party intellectual property rights is a competitive area, and several more established companies may pursue strategies to license or acquire third-party intellectual property rights that we may consider attractive or necessary. These established companies may have a competitive advantage over us due to their size, capital 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 or at all. 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 the relevant program or product candidate, which could have a material adverse effect on our business.

Third parties may initiate legal proceedings alleging that we are infringing their intellectual property rights, the outcome of which would be uncertain.

As our current and future product candidates progress toward commercialization, the possibility of a patent infringement claim against us increases. We cannot provide any assurance that our current and future product candidates do not infringe other parties' patents or other proprietary rights, and competitors or other parties may assert that we infringe their proprietary rights in any event. We may become party to, or threatened with, adversarial proceedings or litigation regarding intellectual property rights with respect to our current and future product candidates, including interference or derivation proceedings before the USPTO. Even if we believe such claims are without merit, a court of competent jurisdiction could hold that these third-party patents are valid, enforceable and infringed, which could have a negative impact on our ability to commercialize bentracimab, pemziviptadil, PB6440 or any future product candidates. In order to successfully challenge the validity of any such United States patent in federal court, we would need to overcome a presumption of validity. As this burden is high and requires us to present clear and convincing evidence as to the invalidity of any such United States patent claim, there is no assurance that a court of competent jurisdiction would agree with us and invalidate the claims of any such United States patent. Moreover, given the vast number of patents in our field of technology, we cannot be certain that we do not infringe existing patents or that we will not infringe patents that may be granted in the future.

While we may decide to initiate proceedings to challenge the validity of these or other patents in the future, we may be unsuccessful, and courts or patent offices in the United States and abroad could uphold the validity of any such patent. Furthermore, because patent applications can take many years to issue and may be confidential for 18 months or more after filing, and because pending patent claims can be revised before issuance, there may be applications now pending which may later result in issued patents that may be infringed by the manufacture, use or sale of our product candidates. Regardless of when filed, we may fail to identify relevant third-party patents or patent applications, or we may incorrectly conclude that a third-party patent is invalid or not infringed by our product candidates or activities. If a patent holder believes that one of our product candidates infringes its patent, the patent holder may sue us even if we have received patent protection for our technology. Moreover, we may face patent infringement claims from non-practicing entities that have no relevant drug revenue and against whom our own patent portfolio may thus have no deterrent effect. If a patent infringement suit were threatened or brought against us, we could be forced to stop or delay research, development, manufacturing or sales of the drug or product candidate that is the subject of the actual or threatened suit.

If we are found to infringe a third party's intellectual property rights, we could be required to obtain a license from such third party to continue commercializing our product candidates. However, we may not be able to obtain any required license on commercially reasonable terms or at all. Even if a license can be obtained on acceptable terms, the rights may be non-exclusive, which could give our competitors access to the same technology or intellectual property rights licensed to us. If we fail to obtain a required license, we may be unable to effectively market product candidates based on our technology, which could limit our ability to generate revenue or achieve profitability and possibly prevent us from generating revenue sufficient to sustain our operations. Alternatively, we may need to redesign our infringing products, which may be impossible or require substantial time and monetary expenditure. Under certain circumstances, we could be forced, including by court orders, to cease commercializing our product candidates. In addition, in any such proceeding or litigation, we could be found liable for substantial monetary damages, potentially including treble damages and attorneys' fees, if we are found to have willfully infringed the patent at issue. A finding of infringement could prevent us from commercializing our product candidates or force us to cease some of our business operations, which could harm our business. Any claims by third parties that we have misappropriated their confidential information or trade secrets could have a similar negative impact on our business.

The cost to us in defending or initiating any litigation or other proceeding relating to patent or other proprietary rights, even if resolved in our favor, could be substantial, and litigation would divert our management's attention. Some of our competitors may be able to sustain the costs of complex patent litigation more effectively than we can because they have substantially greater resources. Uncertainties resulting from the initiation and continuation of patent litigation or other proceedings could delay our research and development efforts and limit our ability to continue our operations.

We may be subject to claims that our employees, consultants, or independent contractors have wrongfully used or disclosed confidential information of third parties.

We employ individuals who were previously employed at other biotechnology or biopharmaceutical companies. Although we try to ensure that our employees, consultants and advisors do not use the proprietary information or know-how of others in their work for us, we may be subject to claims that we or our employees, consultants, or independent contractors have inadvertently or otherwise used or disclosed confidential information of our employees' former employers or other third parties. We may also be subject to claims that former employers or other third parties have an ownership interest in our future patents. Litigation may be necessary to defend against these claims. There is no guarantee of success in defending these claims, and even if we are successful, litigation could result in substantial cost and be a distraction to our management and other employees.

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

We may also be subject to claims that former employees, collaborators, or other third parties have an ownership interest in our patent applications, our future patents, or other intellectual property. We may be subject to ownership disputes in the future arising, for example, from conflicting obligations of consultants or others who are involved in developing our product candidates. Although it is our policy to require our employees and contractors who may be involved in the conception or development of intellectual property to execute agreements assigning such intellectual property to us, we may be unsuccessful in executing such an agreement with each party who, in fact, conceives or develops intellectual property that we regard as our own, and we cannot be certain that our agreements with such parties will be upheld in the face of a potential challenge, or that they will not be breached, for which we may not have an adequate remedy. The assignment of intellectual property rights may not be self-executing or the assignment agreements may be breached, and 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 as exclusive ownership of, or right to use, valuable intellectual property. 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 be a distraction to management and other employees.

Reliance on third parties 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.

If we rely on third parties to manufacture or commercialize bentracimab, pemziviptadil, PB6440 or any future product candidates, or if we collaborate with additional third parties for the development of bentracimab, pemziviptadil, PB6440 or any future product candidates, we must, at times, share trade secrets with them. We may also conduct joint research and development programs that may require us to share trade secrets under the terms of our research and development partnerships or similar agreements. We seek to protect our proprietary technology in part by entering into confidentiality agreements and, if applicable, material transfer agreements, consulting agreements or other similar agreements with our advisors, employees, third-party contractors 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, including our trade secrets. 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 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, a competitor's discovery of our trade secrets or other unauthorized use or disclosure could have an adverse effect on our business and results of operations.

In addition, these agreements typically restrict the ability of our advisors, employees, third-party contractors and consultants to publish data potentially relating to our trade secrets. Despite our efforts to protect our trade secrets, we may not be able to prevent the unauthorized disclosure or use of our technical know-how or other trade secrets by the parties to these agreements. Moreover, we cannot guarantee that we have entered into such agreements with each party that may have or have had access to our confidential information or proprietary technology and processes. Monitoring unauthorized uses and disclosures is difficult, and we do not know whether the steps we have taken to protect our proprietary technologies will be effective. If any of the collaborators, scientific advisors, employees, contractors and consultants who are parties to these agreements breaches or violates the terms of any of these agreements, we may not have adequate remedies for any such breach or violation, and we could lose our trade secrets as a result. Moreover, if confidential information that is licensed or disclosed to us by our partners, collaborators, or others is inadvertently disclosed or subject to a breach or violation, we may be exposed to liability to the owner of that confidential information. Enforcing a claim that a third party illegally obtained and is using our trade secrets, like patent litigation, is expensive and time consuming, and the outcome is unpredictable. In addition, courts outside the United States are sometimes less willing to protect trade secrets.

We may enjoy only limited geographical protection with respect to certain patents, and we may not be able to protect our intellectual property rights throughout the world.

Filing and prosecuting patent applications and defending patents covering our product candidates in all countries throughout the world would be prohibitively expensive. 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 where enforcement rights are not as strong as that in the United States or Europe. These products may compete with our product candidates, and our future patents or other intellectual property rights may not be effective or sufficient to prevent them from competing.

In addition, we may decide to abandon national and regional patent applications before they are granted. The examination of each national or regional patent application is an independent proceeding. As a result, patent applications in the same family may issue as patents in some jurisdictions, such as in the United States, but may issue as patents with claims of different scope or may even be refused in other jurisdictions. It is also quite common that depending on the country, the scope of patent protection may vary for the same product candidate or technology.

While we intend to protect our intellectual property rights in our expected significant markets, we cannot ensure that we will be able to initiate or maintain similar efforts in all jurisdictions in which we may wish to market our product candidates. Accordingly, our efforts to protect our intellectual property rights in such countries may be inadequate, which may have an adverse effect on our ability to successfully commercialize our product candidates in all of our expected significant foreign markets. If we encounter difficulties in protecting, or are otherwise precluded from effectively protecting, the intellectual property rights important for our business in such jurisdictions, the value of these rights may be diminished, and we may face additional competition from others in those jurisdictions.

The laws of some jurisdictions do not protect intellectual property rights to the same extent as the laws or rules and regulations in the United States and Europe, and many companies have encountered significant difficulties in protecting and defending such rights in such jurisdictions. The legal systems of certain countries, particularly certain developing countries, do not favor the enforcement of patents, trade secrets, and other intellectual property rights, which could make it difficult for us to stop the infringement of our future patents or marketing of competing products in violation of our proprietary rights generally. Proceedings to enforce our patent rights in other jurisdictions, whether or not successful, could result in substantial costs and divert our efforts and attention from other aspects of our business, could put our future patents at risk of being invalidated or interpreted narrowly and our patent applications at risk of not issuing as patents, 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.

Some countries also have compulsory licensing laws under which a patent owner may be compelled to grant licenses to third parties. In addition, some countries limit the enforceability of patents against government agencies or government contractors. In those countries, the patent owner may have limited remedies, which could materially diminish the value of such patents. 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.

Obtaining and maintaining our patent protection depends on compliance with various procedural, document submission, fee payment, and other requirements imposed by government 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 government fees on patents and/or applications will be due to be paid to the USPTO and various government patent agencies outside of the United States over the lifetime of our patents and/or applications and any patent rights we may obtain in the future. Furthermore, the USPTO and various non-United States government patent agencies require compliance with several procedural, documentary, fee payment and other similar provisions during the patent application process. In many cases, an inadvertent lapse of a patent or patent application can be cured by payment of a late fee or by other means in accordance with the applicable rules. There are situations, however, in which non-compliance can result in abandonment or lapse of the patents or patent applications, resulting in partial or complete loss of patent rights in the relevant jurisdiction. In such an event, potential competitors might be able to enter the market, which could have a material adverse effect on our business.

Any trademarks we have obtained or may obtain may be infringed or otherwise violated, or successfully challenged, resulting in harm to our business.

We expect to rely on trademarks as one means to distinguish our product candidates, if approved for marketing, from the drugs of our competitors. Once we select new trademarks and apply to register them, our trademark applications may not be approved. Third parties may oppose or attempt to cancel our trademark applications or trademarks, or otherwise challenge our use of the trademarks. In the event that our trademarks are successfully challenged, we could be forced to rebrand our drugs, which could result in loss of brand recognition and could require us to devote resources to advertising and marketing new brands. Our competitors may infringe or otherwise violate our trademarks and we may not have adequate resources to enforce our trademarks. Any of the foregoing events may have a material adverse effect on our business.

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. The following examples are illustrative:

- others may be able to make products that are similar to or otherwise competitive with our product candidates but that are not covered by the claims of our current or future patents;
- an in-license necessary for the manufacture, use, sale, offer for sale or importation of one or more of our product candidates may be terminated by the licensor;
- we or future collaborators might not have been the first to make the inventions covered by our issued or future issued patents or our pending patent applications;
- we or future collaborators might not have been the first to file patent applications covering certain of our 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 our pending patent applications will not lead to issued patents;
- issued patents that we own or in-license may be held invalid or unenforceable as a result of legal challenges by our competitors;
- issued patents that we own or in-license may not provide coverage for all aspects of our product candidates in all countries;
- 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, they could significantly harm our business, results of operations and prospects.

Risks Related to Legal and Regulatory Compliance Matters

Our relationships with customers, healthcare providers, physicians and third-party payors are subject, directly or indirectly, to federal and state healthcare fraud and abuse laws, false claims laws, health information privacy and security laws, and other healthcare laws and regulations. If we are unable to comply, or have not fully complied, with such laws, we could face substantial penalties.

Healthcare providers, physicians and third-party payors in the United States and elsewhere will play a primary role in the recommendation and prescription of any product candidates for which we obtain marketing approval. Our current and future arrangements with healthcare professionals, principal investigators, consultants, customers and third-party payors subject us to various federal and state fraud and abuse laws and other healthcare laws, including, without limitation, the federal Anti-Kickback Statute, the federal civil and criminal false claims laws and the law commonly referred to as the Physician Payments Sunshine Act and regulations promulgated under such laws. These laws will impact, among other things, our clinical research, proposed sales, marketing and educational programs, and other interactions with healthcare professionals. In addition, we may be subject to patient privacy laws by both the federal government and the states in which we conduct or may conduct our business. The laws that will affect our operations include, but are not limited to:

- the federal Anti-Kickback Statute, which prohibits, among other things, individuals or entities from knowingly and willfully soliciting, receiving, offering or paying any remuneration (including any kickback, bribe or rebate), directly or indirectly, overtly or covertly, in cash or in kind in return for, or to induce, either the referral of an individual, or the purchase, lease, order or arrangement for or recommendation of the purchase, lease, order or arrangement for any good, facility, item or service for which payment may be made, in whole or in part, under a federal healthcare program, such as the Medicare and Medicaid programs. The term "remuneration" has been broadly interpreted to include anything of value. Although there are a number of statutory exceptions and regulatory safe harbors protecting some common activities from prosecution, the exceptions and safe harbors are drawn narrowly. Practices that involve remuneration that may be alleged to be intended to induce prescribing, purchases or recommendations may be subject to scrutiny if they do not qualify for an exception or safe harbor. A person 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 Patient Protection and Affordable Care Act, as amended by the Health Care and Education Reconciliation Act, or collectively, the ACA, signed into law in 2010, provides that 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 federal False Claims Act;
- the federal civil and criminal false claims laws, including, without limitation, the federal False Claims Act, which can be enforced by private citizens through civil whistleblower or qui tam actions, and civil monetary penalty laws which prohibit, among other things, individuals or entities from knowingly presenting, or causing to be presented, claims for payment or approval from the federal government, including Medicare, Medicaid and other government payors, that are false or fraudulent or knowingly making, using or causing to be made or used a false record or statement material to a false or fraudulent claim or to avoid, decrease or conceal an obligation to pay money to the federal government. A claim includes "any request or demand" for money or property presented to the United States federal government. Several pharmaceutical and other healthcare companies have been prosecuted under these laws for allegedly providing free product to customers with the expectation that the customers would bill federal programs for the product. Other companies have been prosecuted for causing false claims to be submitted because of the companies' marketing of products for unapproved, and thus non-reimbursable, uses;
- the federal Health Insurance Portability and Accountability Act of 1996, or HIPAA, which created additional federal criminal statutes that prohibit, among other things, a person from knowingly and willfully executing, or attempting to execute, 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 federal Anti-Kickback Statute, a person or entity does not need to have actual knowledge of the statute 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 their implementing regulations, which imposes certain requirements relating to the privacy, security and transmission of individually identifiable health information on health plans, healthcare clearinghouses and certain healthcare providers, known as "covered entities", and their respective HIPAA "business associates", which are independent contractors that perform certain services involving the use or disclosure of individually identifiable health information and their subcontractors that use, disclose or otherwise process individually identifiable health information. HITECH also created new tiers of civil monetary penalties, amended HIPAA to make civil and criminal penalties directly applicable to business associates, and gave state attorneys general new authority to file civil actions for damages or injunctions in federal courts to enforce HIPAA and seek attorneys' fees and costs associated with pursuing federal civil actions;
- the federal transparency laws, including the federal Physician Payments Sunshine Act, which requires certain manufacturers of drugs, medical devices, biologicals and medical supplies for which payment is available under Medicare, Medicaid or the State Children's Health Insurance Program, with specific exceptions, to report annually to the Centers for Medicare & Medicaid Services, or CMS, information related to: (1) payments or other "transfers of value'' made to physicians (defined to include doctors, dentists, optometrists, podiatrists and chiropractors) and teaching hospitals, and (2) ownership and investment interests held by physicians and their immediate family members, which will be expanded beginning in 2022 to require applicable manufacturers to report such information regarding their

payments or other transfers of value made during the prior year to physicians assistants, nurse practitioners, clinical nurse specialists, anesthesiologist assistants, certified registered nurse anesthetists and certified nurse midwives; and

- state and foreign law equivalents of each of the above federal laws and regulations; state laws that require manufacturers to report information related to payments and other transfers of value to physicians and other healthcare providers, marketing expenditures or drug pricing; 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 that otherwise restrict payments that may be made to healthcare providers; state and local laws that require the registration of pharmaceutical sales representatives; and state and foreign laws that govern 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. For example, the General Data Protection Regulation (EU) 2016/679, or GDPR, which went into effect on May 25, 2018, imposes privacy and security obligations on any entity that collects and/or processes health data from individuals located in the European Union. Under the GDPR, fines of up to 20 million Euros or up to 4% of the annual global turnover of the infringer, whichever is greater, could be imposed for significant non-compliance. In addition, on June 28, 2018, California enacted the California Consumer Privacy Act, or CCPA, which took effect on January 1, 2020. The CCPA gives California residents expanded rights to access and delete their personal information, opt out of certain personal information sharing, and receive detailed information about how their personal information is used. The CCPA provides for civil penalties for violations, as well as a private right of action for data breaches that is expected to increase data breach litigation. Some observers have noted that the CCPA could mark the beginning of a trend toward more stringent state privacy legislation in the United States, which could increase our potential liability and adversely affect our business. As well as complicating our compliance efforts, non-compliance with these laws could result in penalties or significant legal liability.

Because of the breadth of these laws and the narrowness of the statutory exceptions and regulatory safe harbors available, it is possible that some of our business activities could be subject to challenge under one or more of such laws. It is possible that governmental authorities will conclude that our business practices may not comply with current or future statutes, regulations 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 these laws or any other governmental regulations that may apply to us, we may be subject to significant penalties, including, without limitation, civil, criminal and administrative penalties, damages, fines, disgorgement, imprisonment, exclusion from participating in federal and state funded healthcare programs, such as Medicare and Medicaid, 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, diminished profits and future earnings, reputational harm and the curtailment or restructuring of our operations, any of which could harm our business.

The risk of our being found in violation of these laws is increased by the fact that many of them have not been fully interpreted by the regulatory authorities or the courts, and their provisions are open to a variety of interpretations. Efforts to ensure that our business arrangements with third parties will comply with applicable healthcare laws and regulations will involve substantial costs. Any action against us for violation of these laws, even if we successfully defend against it, could cause us to incur significant legal expenses and divert our management's attention from the operation of our business. The shifting compliance environment and the need to build and maintain robust and expandable systems to comply with multiple jurisdictions with different compliance and/or reporting requirements increases the possibility that a healthcare company may run afoul of one or more of the requirements.

Even if we obtain regulatory approval for bentracimab, pemziviptadil, PB6440 or any future product candidates, they will remain subject to ongoing regulatory oversight.

Even if we obtain any regulatory approval for bentracimab, pemziviptadil, PB6440 or any future product candidates, such product candidates, once approved, will be subject to ongoing regulatory requirements applicable to manufacturing, labeling, packaging, storage, advertising, promoting, sampling, record-keeping and submitting of safety and other post-market information, among other things. Any regulatory approvals that we receive for bentracimab, pemziviptadil, PB6440 or any future product candidates may also be subject to a risk evaluation and mitigation strategy, limitations on the approved indicated uses for which the drug may be marketed or to the conditions of approval, or requirements that we conduct potentially costly post-marketing testing, including Phase 4 trials, and in the event that we receive accelerated approval of bentracimab, the completion of a Phase 3 trial, and surveillance to monitor the quality, safety and efficacy of the drug. An unsuccessful post-marketing study or failure to complete such a study could result in the withdrawal of marketing approval. We

will further be required to immediately report any serious and unexpected adverse events and certain quality or production problems with our products to regulatory authorities along with other periodic reports.

Any new legislation addressing drug safety issues could result in delays in product development or commercialization, or increased costs to assure compliance. We will also have to comply with requirements concerning advertising and promotion for our products. Promotional communications with respect to prescription drug products are subject to a variety of legal and regulatory restrictions and must be consistent with the information in the product's approved label. As such, we will not be allowed to promote our products for indications or uses for which they do not have approval, commonly known as off-label promotion. The holder of an approved BLA must submit new or supplemental applications and obtain prior approval for certain changes to the approved product, product labeling, or manufacturing process.

In addition, drug manufacturers are subject to payment of user fees and continual review and periodic inspections by the FDA and other regulatory authorities for compliance with cGMP requirements and adherence to commitments made in the BLA or NDA or foreign marketing application. If we, or a regulatory authority, discover previously unknown problems with a drug, such as adverse events of unanticipated severity or frequency, or problems with the facility where the drug is manufactured or if a regulatory authority disagrees with the promotion, marketing or labeling of that drug, a regulatory authority may impose restrictions relative to that drug, the manufacturing facility or us, including requesting a recall or requiring withdrawal of the drug from the market or suspension of manufacturing.

If we fail to comply with applicable regulatory requirements following approval of bentracimab, pemziviptadil, PB6440 or any future product candidates, a regulatory authority may:

- issue an untitled letter or warning letter asserting that we are in violation of the law;
- seek an injunction or impose administrative, civil or criminal penalties or monetary fines;
- suspend or withdraw regulatory approval;
- suspend any ongoing clinical trials;
- refuse to approve a pending BLA, NDA or comparable foreign marketing application (or any supplements thereto) submitted by us or our strategic partners;
- restrict the marketing or manufacturing of the drug;
- seize or detain the drug or otherwise require the withdrawal of the drug from the market;
- refuse to permit the import or export of product candidates; or
- refuse to allow us to enter into supply contracts, including government contracts.

Any government investigation of alleged violations of law could require us to expend significant time and resources in response and could generate negative publicity. The occurrence of any event or penalty described above may inhibit our ability to commercialize bentracimab, pemziviptadil, PB6440 or any future product candidates and harm our business, financial condition, results of operations and prospects.

Healthcare legislative or regulatory reform measures may have a negative impact on our business and results of operations.

In the United States and some foreign jurisdictions, there have been, and continue 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 our ability to profitably sell any product candidates for which we obtain marketing approval.

Among policy makers and payors in the United States and elsewhere, 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 ACA was passed, which substantially changed the way healthcare is financed by both the government and private insurers and significantly impacts the United States pharmaceutical industry. The ACA, among other things contains a number of provisions of particular import to the pharmaceutical and biotechnology industries, including, but not limited to, those governing enrollment in federal healthcare programs, 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, and annual fees based on pharmaceutical companies' share of sales to federal health care programs.

There have been executive, judicial and Congressional challenges to certain aspects of the ACA. While Congress has not passed comprehensive repeal legislation, several bills affecting the implementation of certain taxes under the ACA have been signed into law. The Tax Cuts and Jobs Act of 2017, or Tax Act, includes a provision that repealed, effective January 1, 2019, the tax-based shared responsibility payment imposed by the ACA 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." In addition, the 2020 federal spending package permanently eliminated, effective January 1, 2020, the ACA-mandated "Cadillac" tax on high-cost employer-sponsored health coverage and medical device tax and, effective January 1, 2021, also eliminated the health insurer tax. The Bipartisan Budget Act of 2018, or the BBA, among other things, amended the ACA, effective January 1, 2019, to close the coverage gap in most Medicare drug plans, commonly referred to as the "donut hole." On December 14, 2018, a judge for the United States District Court for the Northern District of Texas ruled that the ACA is unconstitutional in its entirety because the "individual mandate" was repealed by Congress as part of the Tax Act. Additionally, on December 18, 2019, the United States Court of Appeals for the Fifth Circuit upheld the District Court ruling that the individual mandate was unconstitutional and remanded the case back to the District Court to determine whether the remaining provisions of the ACA are invalid as well. The U.S. Supreme Court is currently reviewing this case, but it is uncertain when a decision will be made. Although the U.S. Supreme Court has not yet ruled on the constitutionality of the ACA, on January 28, 2021, President Biden issued an executive order to initiate a special enrollment period from February 15, 2021 through May 15, 2021 for purposes of obtaining health insurance coverage through the ACA marketplace. The executive order also instructs certain governmental agencies to review and reconsider their existing policies and rules that limit access to healthcare, including amount others, reexamining Medicaid demonstration projects and waiver programs that include work requirements, and policies that create unnecessary barriers to obtaining access to health insurance through Medicaid or the ACA. It is unclear how the Supreme Court ruling, other such litigation and the healthcare reform measures of the Biden administration will impact the ACA and our business.

Other legislative changes have been proposed and adopted since the ACA was enacted. These changes include aggregate reductions to Medicare payments to providers of 2% per fiscal year pursuant to the Budget Control Act of 2011, which began in 2013, and due to subsequent legislative amendments to the statute, including the BBA, will remain in effect through 2030, unless additional Congressional action is taken. However, COVID-19 relief legislation suspended the 2% Medicare sequester from May 1, 2020 through March 31, 2021. The American Taxpayer Relief Act of 2012, among other things, further reduced Medicare payments to several providers, including hospitals and cancer treatment centers, and increased the statute of limitations period for the government to recover overpayments to providers from three to five years. These laws may result in additional reductions in Medicare and other healthcare funding, which could have an adverse effect on customers for our product candidates, if approved, and, accordingly, our financial operations.

Additionally, there has been heightened governmental scrutiny in the United States of pharmaceutical pricing practices in light of the rising cost of prescription drugs and biologics. 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 used several means to propose or implement drug pricing reform, including through federal budget proposals, executive orders and policy initiatives. For example, on July 24, 2020 and September 13, 2020, the Trump administration announced several executive orders related to prescription drug pricing that sought to implement several of the administration's proposals. As a result, the FDA released a final rule on September 24, 2020, effective November 30, 2020, providing guidance for states to build and submit importation plans for drugs from Canada. Further, on November 20, 2020, HHS finalized a regulation removing safe harbor protection for price reductions from pharmaceutical manufacturers to plan sponsors under Part D, either directly or through pharmacy benefit managers, unless the price reduction is required by law. The implementation of the rule has been delayed by the Biden administration from January 1, 2022 to January 1, 2023 in response to ongoing litigation. The rule also creates a new safe harbor for price reductions reflected at the point-of-sale, as well as a safe harbor for certain fixed fee arrangements between pharmacy benefit managers and manufacturers, the implementation of which have also been delayed pending review by the Biden administration until March 22, 2021. On November 20, 2020, CMS issued an interim final rule implementing President Trump's Most Favored Nation executive order, which would tie Medicare Part B payments for certain physician-administered drugs to the lowest price paid in other economically advanced countries, effective January 1, 2021. On December 28, 2020, the U.S. District Court for the Northern District of California issued a nationwide preliminary injunction against implementation of the interim final rule. It is unclear whether the Biden administration will work to reverse these measures or pursue similar policy initiatives. 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.

We expect that these and other healthcare reform measures that may be adopted in the future may result in more rigorous coverage criteria and in additional downward pressure on the price that we receive for any approved drug. 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 our drugs. Further, it is possible that additional governmental action may be taken in response to the COVID-19 pandemic.

Any new regulations or guidance, or revisions or reinterpretations of existing regulations or guidance, may impose additional costs or lengthen FDA review times for bentracimab, pemziviptadil, PB6440 or any future product candidates. We cannot determine how changes in regulations, statutes, policies, or interpretations when and if issued, enacted or adopted, may affect our business in the future. Such changes could, among other things, require:

- additional clinical trials to be conducted prior to obtaining approval;
- changes to manufacturing methods;
- recalls, replacements, or discontinuance of one or more of our products; and
- additional recordkeeping.

Such changes would likely require substantial time and impose significant costs, or could reduce the potential commercial value of bentracimab, pemziviptadil, PB6440 or other product candidates, and could materially harm our business and our financial results. In addition, delays in receipt of or failure to receive regulatory clearances or approvals for any other products would harm our business, financial condition, and results of operations.

Risks Related to Employee Matters and Managing Our Growth

Our future success depends on our ability to retain key executives and to attract, retain and motivate qualified personnel.

We are highly dependent on the management, development, clinical, financial and business development expertise of our executive officers, particularly Jonathan P. Mow, our Chief Executive Officer. Each of our executive officers may currently terminate their employment with us at any time. We do not maintain “key person” insurance for any of our executives or employees.

Recruiting and retaining qualified scientific and clinical personnel and, if we progress the development of our product pipeline toward scaling up for commercialization, manufacturing and sales and marketing personnel, will also be critical to our success. The loss of the services of our executive officers or other key employees could impede the achievement of our development and commercialization objectives and seriously harm our ability to successfully implement our business strategy. Furthermore, replacing executive officers and key employees may be difficult and may take an extended period of time because of the limited number of individuals in our industry with the breadth of skills and experience required to successfully develop, gain regulatory approval of and commercialize products. Competition to hire from this limited pool is intense, and we may be unable to hire, train, retain or motivate these key personnel on acceptable terms given the competition among numerous pharmaceutical and biotechnology companies for similar personnel. We also experience competition for the hiring of scientific and clinical personnel from universities and research institutions. In addition, we rely on consultants and advisors, including scientific and clinical advisors, to assist us in formulating our development and commercialization strategy. Our consultants and advisors may be employed by employers other than us and may have commitments under consulting or advisory contracts with other entities that may limit their availability to us. If we are unable to continue to attract and retain high quality personnel, our ability to pursue our growth strategy will be limited.

We expect to expand our clinical development and regulatory capabilities and potentially implement sales, marketing and distribution capabilities, and as a result, we may encounter difficulties in managing our growth, which could disrupt our operations.

As of December 31, 2020, we had approximately 50 employees. As our development progresses, we expect to experience significant growth in the number of our employees and the scope of our operations, particularly in the areas of clinical product development, regulatory affairs and, if any of our product candidates receives marketing approval, sales, marketing and distribution. To manage our anticipated future growth, we must continue to implement and improve our managerial, operational and financial systems, expand our facilities and continue to recruit and train additional qualified personnel. Due to our limited financial resources and the limited experience of our management team in managing a company with such anticipated growth, we may not be able to effectively manage the expansion of our operations or recruit and train additional qualified personnel. The expansion of our operations may lead to significant costs and may divert our management and business development resources. Any inability to manage growth could delay the execution of our business plans or disrupt our operations.

Our employees, independent contractors, consultants, commercial collaborators, principal investigators, CROs, suppliers and vendors may engage in misconduct or other improper activities, including non-compliance with regulatory standards and requirements.

We are exposed to the risk that our employees, independent contractors, consultants, commercial collaborators, principal investigators, CROs, suppliers and vendors may engage in fraudulent conduct or other illegal activity. Misconduct by these parties could include intentional, reckless and/or negligent conduct or disclosure of unauthorized activities to us that violates FDA regulations, including those laws requiring the reporting of true, complete and accurate information to the FDA, manufacturing standards, federal and state healthcare laws and regulations, and laws that require the true, complete and accurate reporting of financial information or data. In particular, sales, marketing and business arrangements in the healthcare industry are subject to extensive laws and regulations intended to prevent fraud, kickbacks, self-dealing and other abusive practices. These laws and regulations may restrict or prohibit a wide range of pricing, discounting, marketing and promotion, sales commission, customer incentive programs and other business arrangements. Misconduct by these parties could also involve the improper use of individually identifiable information, including, without limitation, information obtained in the course of clinical trials, which could result in regulatory sanctions and serious harm to our reputation. We have adopted a code of business conduct and ethics, but it is not always possible to identify and deter misconduct, 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. 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, including the imposition of significant civil, criminal and administrative penalties, including, without limitation, damages, fines, disgorgement, imprisonment, exclusion from participation in government healthcare programs, such as Medicare and Medicaid, 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, and the curtailment or restructuring of our operations.

Risks Related to Ownership of Our Common Stock and Our Status as a Public Company

An active trading market for our common stock may not continue to be developed or sustained.

Prior to our initial public offering, or IPO, there was no public market for our common stock, and we cannot assure you that an active trading market for our shares will continue to develop or be sustained. As a result, it may be difficult for you to sell shares at an attractive price or at all.

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

Our stock price has been, and may continue to be, volatile. Since our IPO, our common stock has traded at prices ranging from $2.55 to $16.65 per share. The stock market in general and the market for 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 price paid for the shares. The market price for our common stock may be influenced by many factors, including:

- the commencement, enrollment or results of our clinical trials of bentracimab, pemziviptadil, PB6440 or any future clinical trials we may conduct, or changes in the development status of our product candidates;
- any delay in our regulatory filings for bentracimab, pemziviptadil, PB6440 or any other product candidate we may develop, and any adverse development or perceived adverse development with respect to the applicable regulatory authority's review of such filings, including without limitation the FDA's issuance of a "refusal to file" letter or a request for additional information;
- adverse results from, delays in or termination of clinical trials;
- adverse regulatory decisions, including failure to receive regulatory approval of our product candidates;
- unanticipated serious safety concerns related to the use of bentracimab, pemziviptadil, PB6440 or any other product candidate;
- changes in financial estimates by us or by any equity research analysts who might cover our stock;
- conditions or trends in our industry;
- changes in the market valuations of similar companies;

- stock market price and volume fluctuations of comparable companies and, in particular, those that operate in the biopharmaceutical industry;
- publication of research reports about us or our industry or positive or negative recommendations or withdrawal of research coverage by securities analysts;
- announcements by us or our competitors of significant acquisitions, strategic partnerships or divestitures;
- progress under our collaboration with SFJ for the development of bentracimab;
- announcements of investigations or regulatory scrutiny of our operations or lawsuits filed against us;
- investors' general perception of our company and our business;
- recruitment or departure of key personnel;
- overall performance of the equity markets;
- trading volume of our common stock;
- disputes or other developments relating to proprietary rights, including patents, litigation matters and our ability to obtain patent protection for our technologies;
- significant lawsuits, including patent or stockholder litigation;
- changes in the structure of healthcare payment systems;
- general political and economic conditions; and
- other events or factors, many of which are beyond our control.

The stock market in general has, and the Nasdaq Global Market and biotechnology companies in particular have, experienced extreme price and volume fluctuations that have often been unrelated or disproportionate to the operating performance of these companies, including very recently in connection with the ongoing COVID-19 pandemic, which has resulted in decreased stock prices for many companies notwithstanding the lack of a fundamental change in their underlying business models or prospects. Broad market and industry factors, including potentially worsening economic conditions and other adverse effects or developments relating to the ongoing COVID-19 pandemic, may negatively affect the market price of our common stock, regardless of our actual operating performance. The realization of any of the above risks or any of a broad range of other risks, including those described in this section, could have a significant and material adverse impact on the market price of our common stock.

In addition, in the past, stockholders have initiated class action lawsuits against pharmaceutical and biotechnology 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 from our business.

A significant portion of our total outstanding shares are available for immediate resale. This could cause the market price of our common stock to drop significantly, even if our business is doing well.

Sales of a substantial number of shares of our common stock in the public market could occur at any time. If our stockholders sell, or the market perceives that our stockholders intend to sell, substantial amounts of our common stock in the public market, the market price of our common stock could decline significantly.

In addition, we have filed registration statements on Form S-8 registering the issuance of common stock subject to options or other equity awards issued or reserved for future issuance under our equity incentive plans. Shares registered under these registration statements on Form S-8 will be available for sale in the public market subject to vesting arrangements and exercise of options and the restrictions of Rule 144 in the case of our affiliates.

Additionally, the holders of approximately 2.2 million shares of our common stock, or their transferees, have rights, subject to some conditions, to require us to file one or more registration statements covering their shares or to include their shares in registration statements that we may file for ourselves or other stockholders. If we were to register the resale of these shares, they could be freely sold in the public market. If these additional shares 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.

The issuance of additional stock in connection with financings, acquisitions, investments, our equity incentive plan or otherwise will dilute all other stockholders.

Our certificate of incorporation authorizes us to issue up to 200,000,000 shares of common stock and up to 10,000,000 shares of preferred stock with such rights and preferences as may be determined by our board of directors. Subject to compliance with applicable rules and regulations, in the future we may issue common stock or other securities convertible into shares of our common stock from time to time in connection with a financing, acquisition, investment, our equity incentive plan or otherwise. The number of new shares of our common stock issued in connection with raising additional capital could constitute a material portion of the then outstanding shares of our common stock, which could result in substantial dilution to our existing stockholders and cause the market price of our common stock to decline.

Provisions in our corporate charter documents and under Delaware law may prevent or frustrate attempts by our stockholders to change our management and hinder efforts to acquire a controlling interest in us, and the market price of our common stock may be lower as a result.

There are provisions in our certificate of incorporation and bylaws that may make it difficult for a third party to acquire, or attempt to acquire, control of our company, even if a change of control was considered favorable by you and other stockholders. For example, our board of directors has the authority to issue up to 10,000,000 shares of preferred stock. The board of directors can fix the price, rights, preferences, privileges, and restrictions of the preferred stock without any further vote or action by our stockholders. The issuance of shares of preferred stock may delay or prevent a change of control transaction. As a result, the market price of our common stock and the voting and other rights of our stockholders may be adversely affected. An issuance of shares of preferred stock may result in the loss of voting control to other stockholders.

Our charter documents also contain other provisions that could have an anti-takeover effect, including:

- only one of our three classes of directors is elected each year;
- stockholders are not entitled to remove directors other than by a 66 2/3% vote and only for cause;
- stockholders are not permitted to take actions by written consent;
- stockholders cannot call a special meeting of stockholders; and
- stockholders must give advance notice to nominate directors or submit proposals for consideration at stockholder meetings.

In addition, we are subject to the anti-takeover provisions of Section 203 of the Delaware General Corporation Law, which regulates corporate acquisitions by prohibiting Delaware corporations from engaging in specified business combinations with particular stockholders of those companies. These provisions could discourage potential acquisition proposals and could delay or prevent a change of control transaction. They could also have the effect of discouraging others from making tender offers for our common stock, including transactions that may be in your best interests. These provisions may also prevent changes in our management or limit the price that investors are willing to pay for our stock.

Concentration of ownership of our common stock among our existing executive officers, directors and principal stockholders may prevent new investors from influencing significant corporate decisions.

Our executive officers, directors and current beneficial owners of 5% or more of our common stock and their respective affiliates beneficially own a significant percentage of our outstanding common stock. As a result, these persons, acting together, would be able to significantly influence all matters requiring stockholder approval, including the election and removal of directors, any merger, consolidation, sale of all or substantially all of our assets, or other significant corporate transactions.

Some of these persons or entities may have interests different than yours. For example, because many of these stockholders purchased their shares at prices substantially below the current market price of our common stock and have held their shares for a longer period, they may be more interested in selling our company to an acquirer than other investors, or they may want us to pursue strategies that deviate from the interests of other stockholders.

We are an "emerging growth company" and a "smaller reporting company" and, as a result of the reduced disclosure and governance requirements applicable to emerging growth companies and smaller reporting companies, our common stock may be less attractive to investors.

We are an "emerging growth company" as defined in the Jumpstart Our Business Startups Act of 2012, or the JOBS Act, and we intend to take advantage of some of the exemptions from reporting requirements that are applicable to other public companies that are not emerging growth companies, including:

- not being required to comply with the auditor attestation requirements in the assessment of our internal control over financial reporting;
- 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;
- reduced disclosure obligations regarding executive compensation in our periodic reports, proxy statements and registration statements; and
- not being required to hold a nonbinding advisory vote on executive compensation and stockholder approval of any golden parachute payments not previously approved.

We cannot predict if investors will find our common stock less attractive because we will 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 more volatile. We may take advantage of these reporting exemptions until we are no longer an emerging growth company. We will remain an emerging growth company until the earlier of (1) the last day of the fiscal year (a) following the fifth anniversary of the closing of our initial public offering, (b) in which we have total annual gross revenue of at least $1.07 billion, or (c) in which we are deemed to be a large accelerated filer, which means the market value of our common stock that is held by non-affiliates exceeds $700 million as of the prior June 30th, and (2) the date on which we have issued more than $1.0 billion in non-convertible debt during the prior three-year period.

Under Section 107(b) of the JOBS Act, emerging growth companies can delay adopting new or revised accounting standards until such time as those standards apply to private companies. We have irrevocably elected not to avail ourselves of this exemption from new or revised accounting standards and, therefore, we will be subject to the same new or revised accounting standards as other public companies that are not emerging growth companies. Even after we no longer qualify as an emerging growth company, we may, under certain circumstances, still qualify as a "smaller reporting company," which would allow us to take advantage of many of the same exemptions from disclosure requirements, including reduced disclosure obligations regarding executive compensation in our periodic reports and proxy statements and, if we are a smaller reporting company with less than $100 million in annual revenue, we would not be required to obtain an attestation report on internal control over financial reporting issued by our independent registered public accounting firm. We may qualify as a "smaller reporting company" for so long as (i) the market value of our voting and non-voting common stock held by non-affiliates is less than $250 million measured on the last business day of our second fiscal quarter or (ii) our annual revenue is less than $100 million during the most recently completed fiscal year and the market value of our voting and non-voting common stock held by non-affiliates is less than $700 million measured on the last business day of our second fiscal quarter .

We have broad discretion in the use of our cash and cash equivalents.

We have broad discretion over the use of our cash and cash equivalents, including the net proceeds from our recent public offerings. You may not agree with our decisions, and our use of these cash and cash equivalents may not yield any return on your investment. We expect to use our existing cash and cash equivalents to advance bentracimab, pemziviptadil and PB6440, fund development of our ELP technology and preclinical programs and for working capital and general corporate purposes. In addition, we may use a portion of our cash and cash equivalents to pursue our strategy to in-license or acquire additional product candidates. Our failure to apply our cash and cash equivalents effectively could compromise our ability to pursue our growth strategy and we might not be able to yield a significant return, if any, on our investment of these cash and cash equivalents. You will not have the opportunity to influence our decisions on how to use these cash and cash equivalents.

Because we do not anticipate paying any cash dividends on our common stock in the foreseeable future, capital appreciation, if any, will be your sole source of gains and you may never receive a return on your investment.

You should not rely on an investment in our common stock to provide dividend income. We have not declared or paid cash dividends on our common stock to date. We currently intend to retain our future earnings, if any, to fund the development and growth of our business. In addition, the terms of the SFJ Agreement preclude us from paying dividends, and any existing or future debt agreements may preclude us from paying dividends. As a result, capital appreciation, if any, of our common stock will be your sole source of gain for the foreseeable future. Investors seeking cash dividends should not purchase our common stock.

Our amended and restated certificate of incorporation provides that the Court of Chancery of the State of Delaware and the federal district courts of the United States of America will be the exclusive forums 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 provides that the Court of Chancery of the State of Delaware is the exclusive forum for (1) any derivative action or proceeding brought on our behalf, (2) any action asserting a claim for breach of a fiduciary duty owed by any of our directors, officers or other employees to us or our stockholders, (3) any action asserting a claim arising pursuant to any provision of the Delaware General Corporation Law, our amended and restated certificate of incorporation or our amended and restated bylaws or (4) any action asserting a claim governed by the internal affairs doctrine. This provision would not apply to suits brought to enforce a duty or liability created by the Exchange Act. Furthermore, Section 22 of the Securities Act creates concurrent jurisdiction for federal and state courts over all such Securities Act actions. Accordingly, both state and federal courts have jurisdiction to entertain such claims. To prevent having to litigate claims in multiple jurisdictions and the threat of inconsistent or contrary rulings by different courts, among other considerations, our amended and restated certificate of incorporation further provides that the federal district courts of the United States of America will be the exclusive forum for resolving any complaint asserting a cause of action arising under the Securities Act. While the Delaware courts have determined that such choice of forum provisions are facially valid, a stockholder may nevertheless seek to bring a claim in a venue other than those designated in the exclusive forum provisions. In such instance, we would expect to vigorously assert the validity and enforceability of the exclusive forum provisions of our amended and restated certificate of incorporation. This may require significant additional costs associated with resolving such action in other jurisdictions and there can be no assurance that the provisions will be enforced by a court in those other jurisdictions.

These exclusive forum provisions 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. If a court were to find either exclusive-forum provision in our amended and restated certificate of incorporation to be inapplicable or unenforceable in an action, we may incur further significant additional costs associated with resolving the dispute in other jurisdictions, all of which could seriously harm our business.

General Risk Factors

Our business activities will be subject to the Foreign Corrupt Practices Act, or FCPA, and similar anti-bribery and anti-corruption laws.

As we expand our business activities outside of the United States, including our clinical trial efforts, we will be subject to the FCPA and similar anti-bribery or anti-corruption laws, regulations or rules of other countries in which we operate. The FCPA generally prohibits offering, promising, giving, or authorizing others to give anything of value, either directly or indirectly, to a non-United States government official in order to influence official action, or otherwise obtain or retain business. The FCPA also requires public companies to make and keep books and records that accurately and fairly reflect the transactions of the corporation and to devise and maintain an adequate system of internal accounting controls. Our business is heavily regulated and therefore requires significant interaction with public officials, including officials of non-United States governments. Additionally, in many other countries, the healthcare providers who prescribe pharmaceuticals are employed by their government, and the purchasers of pharmaceuticals are government entities; therefore, our dealings with these prescribers and purchasers will be subject to regulation under the FCPA. Recently the Securities and Exchange Commission, or the SEC, and Department of Justice have increased their FCPA enforcement activities with respect to biotechnology and pharmaceutical companies. There is no certainty that all of our employees, agents, suppliers, manufacturers, contractors, or collaborators, or those of our affiliates, will comply with all applicable laws and regulations, particularly given the high level of complexity of these laws. Violations of these laws and regulations could result in fines, criminal sanctions against us, our officers, or our employees, the closing down of facilities, including those of our suppliers and manufacturers, requirements to obtain export licenses, cessation of business activities in sanctioned countries, implementation of compliance programs, and prohibitions on the conduct of our business. Any such violations could include prohibitions on our ability to offer our products in one or more countries as well as difficulties in manufacturing or continuing to develop our products, and could materially damage our reputation, our brand, our international expansion efforts, our ability to attract and retain employees, and our business, prospects, operating results, and financial condition.

If equity research analysts do not publish research or reports, or publish unfavorable research or reports, about us, our business or our market, our stock price and trading volume could decline.

The trading market for our common stock will be influenced by the research and reports that equity research analysts publish about us and our business. As a newly public company, we have only limited research coverage by equity research analysts. Equity research analysts may elect not to provide research coverage of our common stock, and such lack of

research coverage may adversely affect the market price of our common stock. In the event we do have equity research analyst coverage, we will not have any control over the analysts or the content and opinions included in their reports. The price of our stock could decline if one or more equity research analysts downgrade our stock or issue other unfavorable commentary or research. If one or more equity research analysts ceases coverage of our company or fails to publish reports on us regularly, demand for our stock could decrease, which in turn could cause our stock price or trading volume to decline.

If we fail to maintain proper and effective internal controls, our ability to produce accurate financial statements on a timely basis could be impaired.

We are subject to the reporting requirements of the Securities Exchange Act of 1934, the Sarbanes-Oxley Act of 2002, or the Sarbanes-Oxley Act, and the rules and regulations of the stock market on which our common stock is listed. The Sarbanes-Oxley Act requires, among other things, that we maintain effective disclosure controls and procedures and internal control over financial reporting.

We may identify weaknesses in our system of internal financial and accounting controls and procedures that could result in a material misstatement of our financial statements. Our internal control over financial reporting will not prevent or detect all errors and all fraud. A control system, no matter how well designed and operated, can provide only reasonable, not absolute, assurance that the control system's objectives will be met. Because of the inherent limitations in all control systems, no evaluation of controls can provide absolute assurance that misstatements due to error or fraud will not occur or that all control issues and instances of fraud will be detected.

If we are not able to comply with the requirements of Section 404 of the Sarbanes-Oxley Act in a timely manner, or if we are unable to maintain proper and effective internal controls, we may not be able to produce timely and accurate financial statements. If that were to happen, the market price of our stock could decline and we could be subject to sanctions or investigations by the stock exchange on which our common stock is listed, the SEC, or other regulatory authorities.

New or future changes to tax laws could materially adversely affect our company.

On December 22, 2017, President Trump signed into law H.R. 1, "An Act to provide for reconciliation pursuant to titles II and V of the concurrent resolution on the budget for fiscal year 2018", informally titled the Tax Cuts and Jobs Act, or the Tax Act, which significantly revises the United States Internal Revenue Code of 1986, as amended. Future guidance from the United States Internal Revenue Service and other tax authorities with respect to the Tax Act may affect us, and certain aspects of the Tax Act could be repealed or modified in future legislation. For example, on March 27, 2020, President Trump signed into law the CARES Act, which modifies the Tax Act in certain respects. Changes in corporate tax rates, the realization of net deferred tax assets relating to our United States operations, the taxation of foreign earnings, and the deductibility of expenses under the Tax Act or future tax reform legislation could have a material impact on the value of our deferred tax assets, could result in significant one-time charges in the current or future taxable years, and could increase our future United States tax expense. The foregoing items, as well as any other future changes in tax laws, could have a material adverse effect on our business, cash flow, financial condition, or results of operations. In addition, it is uncertain if and to what extent various states will conform to the Tax Act or any newly enacted federal tax legislation.

We might not be able to utilize a significant portion of our net operating loss carryforwards.

At December 31, 2020, we had federal and state net operating loss, or NOL, carryforwards of $185.1 million, $167.2 million, respectively. The federal NOLs generated prior to 2018 may be used to offset up to 100% of future taxable income and will begin to expire in 2022, unless previously utilized or limited by other provisions within the tax law. These net operating loss carryforwards could expire unused and be unavailable to offset future income tax liabilities. Under the Tax Act, as modified by the CARES Act, federal net operating losses incurred in taxable years beginning after December 31, 2017 and in future years may be carried forward indefinitely, but the deductibility of such federal net operating losses incurred in the taxable year beginning after December 31, 2020 is limited. It is uncertain how various states will respond to the Tax Act and CARES Act. In addition, under Section 382 of the Internal Revenue Code of 1986, as amended, and corresponding provisions of state law, if a corporation undergoes an "ownership change," which is generally defined as a greater than 50% change, by value, in its equity ownership over a three-year period, the corporation's ability to use its pre-change net operating loss carryforwards and other pre-change tax attributes to offset its post-change income or taxes may be limited. We may experience ownership changes as a result of subsequent shifts in our stock ownership, some of which may be outside of our control. If an ownership change occurs and our ability to use our net operating loss carryforwards is materially limited, it would harm our future operating results by effectively increasing our future tax obligations.

Our effective tax rate may fluctuate, and we may incur obligations in tax jurisdictions in excess of accrued amounts.

We are subject to taxation in more than one tax jurisdiction. As a result, our effective tax rate is derived from a combination of applicable tax rates in the various places that we operate. In preparing our financial statements, we estimate the amount of tax that will become payable in each of such places. Nevertheless, our effective tax rate may be different than experienced in the past due to numerous factors, including passage of the newly enacted federal income tax law, changes in the mix of our profitability from jurisdiction to jurisdiction, the results of examinations and audits of our tax filings, our inability to secure or sustain acceptable agreements with tax authorities, changes in accounting for income taxes and changes in tax laws. Any of these factors could cause us to experience an effective tax rate significantly different from previous periods or our current expectations and may result in tax obligations in excess of amounts accrued in our financial statements.

We have begun incurring increased costs and demands upon management as a result of being a public company.

As a public company listed in the United States, we are incurring significant additional legal, accounting and other costs. These additional costs could negatively affect our financial results. In addition, changing laws, regulations and standards relating to corporate governance and public disclosure, including regulations implemented by the SEC and the Nasdaq Stock Market, may increase legal and financial compliance costs and make some activities more time-consuming. These laws, regulations and standards are subject to varying interpretations and, as a result, their application in practice may evolve over time as new guidance is provided by regulatory and governing bodies. We intend to invest resources to comply with evolving laws, regulations and standards, and this investment may result in increased general and administrative expense and a diversion of management's time and attention from revenue-generating activities to compliance activities. If notwithstanding our efforts to comply with new laws, regulations and standards, we fail to comply, regulatory authorities may initiate legal proceedings against us and our business may be harmed.

Failure to comply with these rules might also make it more difficult for us to obtain some types of insurance, including director and officer liability insurance, and we might be forced to accept reduced policy limits and coverage or incur substantially higher costs to obtain the same or similar coverage. The impact of these events could also make it more difficult for us to attract and retain qualified persons to serve on our board of directors, on committees of our board of directors or as members of senior management.

Our business and operations would suffer in the event of computer system failures, cyberattacks or a deficiency in our cybersecurity.

Despite the implementation of security measures, our internal computer systems, and those of third parties on which we rely, are vulnerable to damage from computer viruses, malware, natural disasters, terrorism, war, telecommunication and electrical failures, cyberattacks or cyber-intrusions over the Internet, attachments to emails, persons inside our organization, or persons with access to systems inside our organization. The risk of a security breach or disruption, particularly through cyberattacks or cyber intrusion, including by computer hackers, foreign governments, and cyber terrorists, has generally increased as the number, intensity and sophistication of attempted attacks and intrusions from around the world have increased. If such an event were to occur and cause interruptions in our operations, it could result in a material disruption of our product development programs. For example, the loss of clinical trial data from completed or ongoing or planned clinical trials could result in delays in our regulatory approval efforts and significantly increase our costs to recover or reproduce the data. To the extent that any disruption or security breach was to result in a loss of or damage to our data or applications, or inappropriate disclosure of confidential or proprietary information, we could incur material legal claims and liability and damage to our reputation, and the further development of our product candidates could be delayed.

Item 1B. Unresolved Staff Comments.

None.

Item 2. Properties.

We lease 25,000 square feet of research and development and administrative space at two locations in Malvern, Pennsylvania, pursuant to lease agreements that both expire in September 2023. We also lease 4,000 square feet of administrative space in San Diego, California, pursuant to a lease agreement that expires in October 2022. We believe that our existing facilities are suitable and adequate to meet our current needs. We intend to add new facilities or expand existing facilities as we add employees, and we believe that suitable additional or substitute space will be available as needed to accommodate any such expansion of our operations.

Item 3. Legal Proceedings.

We are not subject to any material legal proceedings. From time to time, we may be involved in various claims and legal proceedings relating to claims arising out of our operations. We are not currently a party to any legal proceedings that, in the opinion of our management, are likely to have a material adverse effect on our business. Regardless of outcome, litigation can have an adverse impact on us because of defense and settlement costs, diversion of management resources and other factors.

Item 4. Mine Safety Disclosures.

Not applicable.

PART II

Item 5. Market for Registrant's Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities.

Market Information for Common Stock

Our common stock is listed on The Nasdaq Global Market under the symbol "PHAS."

Holders of Record

As of March 11, 2021, we had 51 holders of record of our common stock, which excludes stockholders whose shares were held in nominee or street name by brokers. The actual number of common stockholders is greater than the number of record holders, and includes stockholders who are beneficial owners, but whose shares are held in street name by brokers and other nominees. This number of holders of record also does not include stockholders whose shares may be held in trust by other entities.

Dividend Policy

We have never paid cash dividends on any of our capital stock and currently intend to retain our future earnings, if any, to fund the development and growth of our business.

Unregistered Sales of Equity Securities

None.

Purchases of Equity Securities by the Issuer and Affiliated Parties

None.

Item 6. Selected Financial Data.

We are a smaller reporting company as defined by Rule 12b-2 of the Exchange Act and are not required to provide the information required under this item.

Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations.

The following discussion and analysis of our financial condition and results of operations should be read in conjunction with our financial statements and related notes and the related Management's Discussion and Analysis of Financial Condition and Results of Operations included in this Annual Report on Form 10-K.

Overview

We are a clinical-stage biopharmaceutical company focused on the development and commercialization of novel therapies for cardiopulmonary diseases. Our lead product candidate, bentracimab (also known as PB2452), is a novel reversal agent for the antiplatelet drug ticagrelor, which we are developing for the reversal of the antiplatelet effects of ticagrelor in patients with uncontrolled major or life-threatening bleeding or requiring urgent surgery or an invasive procedure. Based on feedback from the United States Food and Drug Administration, or FDA, we intend to seek approval of bentracimab in the United States through an accelerated approval process. In our completed Phase 2a clinical trial of bentracimab, we observed immediate and complete reversal of ticagrelor's antiplatelet activity within five minutes following initiation of infusion and sustained reversal for over 20 hours. Our second product candidate, pemziviptadil (also known as PB1046), is a once-weekly fusion protein currently in a Phase 2b clinical trial for the treatment of pulmonary arterial hypertension, or PAH. Pemziviptadil utilizes our proprietary half-life extending elastin-like polypeptide, or ELP, technology, which also serves as an engine for our preclinical pipeline. We are also developing our preclinical product candidate, PB6440, for treatment-resistant hypertension. We retain worldwide commercial rights to all of our product candidates.

As we advance our clinical programs for bentracimab and pemziviptadil with site activations and patient enrollment, we remain in close contact with our clinical research organizations, clinical sites and suppliers to attempt to assess the impacts that COVID-19 may have on our clinical trials and current timelines and to consider whether we can implement appropriate mitigating measures to help lessen such impacts. At this time, however, we cannot fully forecast the scope of

impacts that COVID-19 may have on our ability to initiate trial sites, enroll and assess patients, supply study drug and report trial results.

We are developing bentracimab pursuant to a co-development agreement, or the SFJ Agreement, with SFJ Pharmaceuticals X, Ltd., an SFJ Pharmaceuticals Group company, or SFJ. Under the SFJ Agreement, SFJ has agreed to pay us up to $120.0 million to support the clinical development of bentracimab. During the term of the SFJ Agreement, we will have primary responsibility for clinical development and regulatory activities for bentracimab in the United States and the European Union, while SFJ will have primary responsibility for clinical development and regulatory activities for bentracimab in China and Japan and will provide clinical trials operations support in the European Union.

In March 2020, we commenced our pivotal REVERSE-IT trial, a global, multi-center, non-randomized, open-label trial in which we plan to enroll a total of 200 ticagrelor patients with uncontrolled major or life-threatening bleeding or requiring urgent surgery or an invasive procedure. The primary endpoints for this trial are the reversal of the antiplatelet effects of ticagrelor with intravenous infusion of bentracimab as measured by the VerifyNow® PRUTest® biomarker and achievement of clinical hemostasis in enrolled patients. We are currently enrolling patients in the United States, the European Union and Canada in this trial.

The FDA granted Breakthrough Therapy designation for bentracimab in April 2019. The European Medicines Agency, or the EMA, granted bentracimab Priority Medicines, or PRIME, designation in February 2020. Based on feedback from the FDA, we intend to submit a Biologics License Application, or BLA, for potential accelerated approval based on an interim analysis of the first approximately 100 patients treated in our REVERSE-IT trial, targeting that approximately one half of patients enrolled have uncontrolled major or life-threatening bleeding and approximately one half require urgent surgery or an invasive procedure. After we submit our BLA with data from the first 100 patients, we intend to complete the REVERSE-IT trial and establish a post-approval registry in accordance with FDA requirements. The Committee for Medicinal Products for Human Use, or CHMP, of the EMA has also generally agreed with our proposed clinical development plan for bentracimab.

We have enrolled more than half of the first approximately 100 patients needed to support our BLA submission, nearly all of whom to date have required urgent surgery or an invasive procedure. We are attempting to accelerate enrollment of patients with uncontrolled major or life-threatening bleeding, including by working to increase the number of enrolling clinical trial sites in the United States, Canada, and the European Union as we believe that a broader site footprint will increase the probability of enrolling these patients. All of the first approximately 100 patients enrolled in the REVERSE-IT trial will be measured against the same VerifyNow PRUTest biomarker described above.

We expect to complete enrollment of the first 100 patients in the REVERSE-IT trial in mid-2021, and are targeting to submit our BLA for bentracimab in mid-2022, although those timelines could be impacted by the continued scope and duration of the COVID-19 pandemic.

We have a limited operating history. Since our inception in 2002, our operations have focused on developing our clinical and preclinical product candidates and our proprietary ELP technology, organizing and staffing our company, business planning, raising capital, establishing our intellectual property portfolio and conducting clinical trials and preclinical studies. We do not have any product candidates approved for sale and have not generated any revenue from product sales. Since inception, we have financed our operations primarily through the sale of equity and debt securities and our term loans with Silicon Valley Bank, or SVB, and WestRiver Innovation Lending Fund VIII, L.P., or WestRiver.

In April 2019, we received $46.3 million in net proceeds from an underwritten public offering of our common stock. In May 2019, we received an additional $2.5 million under our term loan with SVB and WestRiver, or our 2019 Loan, and in October 2019, we received an additional $5.0 million under our 2019 Loan. In January 2020, we entered into the SFJ Agreement pursuant to which SFJ has agreed to provide us up to $120.0 million of funding to support the clinical development of bentracimab. As of December 31, 2020, SFJ has provided funding and paid for amounts on our behalf in the aggregate amount of $47.1 million under the SFJ Agreement. In addition, we expect that SFJ will fund or reimburse an additional $42.9 million of clinical trial costs and other expenses. SFJ will also provide up to an additional $30.0 million of funding upon the achievement of specified clinical development milestones with respect to our ongoing REVERSE-IT trial of bentracimab.

Since our inception, we have incurred significant operating losses. Our net loss was $98.6 million for the year ended December 31, 2020. As of December 31, 2020, we had an accumulated deficit of $260.7 million. We expect to continue to incur significant expenses and operating losses for the foreseeable future. We anticipate that our expenses will increase substantially in connection with our ongoing activities, as we:

- continue our ongoing clinical trials of bentracimab and pemziviptadil, as well as initiate and complete additional clinical trials, as needed;

- seek to expand our geographical reach through the SFJ Agreement and the corresponding clinical development support fees that we will incur;
- pursue regulatory approvals for bentracimab as a reversal agent for the antiplatelet drug ticagrelor and pemziviptadil for the treatment of PAH;
- develop PB6440 for treatment-resistant hypertension;
- seek to discover and develop additional clinical and preclinical product candidates;
- scale up our clinical and regulatory capabilities;
- establish a commercialization infrastructure and scale up external manufacturing and distribution capabilities to commercialize any product candidates for which we may obtain regulatory approval, including bentracimab and pemziviptadil;
- adapt our regulatory compliance efforts to incorporate requirements applicable to marketed products;
- maintain, expand and protect our intellectual property portfolio;
- hire additional clinical, manufacturing and scientific personnel;
- add operational, financial and management information systems and personnel, including personnel to support our product development and possible future commercialization efforts; and
- incur additional legal, accounting and other expenses in operating as a public company.

Recent Development

In March 2021, we entered into a supply agreement with BioVectra Inc. for the manufacture and supply of bulk drug substance for bentracimab for commercial distribution following regulatory approval. Under the terms of the supply agreement, BioVectra has committed to maintaining capacity to manufacture an agreed number of batches of product per year, although we are free to contract with third parties for the manufacture of bentracimab. Refer to "Item 1. Business" under the subheading *Business - License, Co-Development and Other Agreements - BioVectra Supply Agreement* in this annual report.

FINANCIAL OVERVIEW

Components of Operating Results

Revenue

Grant Revenue

Grant revenue is derived from government grants that support our efforts on specific research projects. We recognize grant revenue when there is reasonable assurance of compliance with the conditions of the grant and reasonable assurance that the grant revenue will be received.

Revenue Under Collaborative Agreement

Revenue under collaborative agreement is derived from an agreement with our collaboration partner, ImmunoForge Co., Ltd., or ImmunoForge. We have granted ImmunoForge a license to develop certain compound indications in exchange for an upfront license payment and event-based payments subject to ImmunoForge's achievement of specified development, regulatory and sales-based milestones. In addition, we are entitled to royalties if products under the collaboration are commercialized. We recognize revenue for upfront amounts when the license is transferred to ImmunoForge. Development milestones and other fees are recognized as revenue when it is probable that the amount will not result in a significant reversal of revenue in the future. Sales-based milestones and royalties cannot be recognized until the underlying sales occur.

Research and Development Expense

Research and development expense consists of expenses incurred in connection with the discovery and development of our product candidates. We expense research and development costs as incurred. These expenses include:

- expenses incurred under agreements with contract research organizations, or CROs, as well as investigative sites and consultants that conduct our clinical trials and preclinical studies;

- manufacturing and supply scale-up expenses and the cost of acquiring and manufacturing preclinical and clinical trial supply and potential commercial supply, including manufacturing validation batches;
- clinical development support fees that we incur related to the SFJ Agreement;
- outsourced professional scientific development services;
- employee-related expenses, which include salaries, benefits and stock-based compensation;
- expenses relating to regulatory activities; and
- laboratory materials and supplies used to support our research activities.

Research and development activities are central to our business model. Product candidates in later stages of clinical development generally have higher development costs than those in earlier stages of clinical development, primarily due to the increased size and duration of later-stage clinical trials. We expect our research and development expense to increase significantly over the next several years as we increase personnel costs, including stock-based compensation, conduct our later-stage clinical trials for bentracimab and pemziviptadil, develop PB6440, conduct other preclinical studies and clinical trials and prepare regulatory filings and, if we receive regulatory approval for one or more product candidates, prepare for commercialization efforts.

The successful development of our product candidates is highly uncertain. At this time, we cannot reasonably estimate or know the nature, timing and costs of the efforts that will be necessary to complete the remainder of the development of our product candidates, or when, if ever, material net cash inflows may commence from those candidates. This uncertainty is due to the numerous risks and uncertainties associated with the duration and cost of clinical trials, which vary significantly over the life of a project as a result of many factors, including:

- delays in regulators or institutional review boards authorizing us or our investigators to commence our clinical trials or in our ability to negotiate agreements with clinical trial sites or contract research organizations;
- our ability to secure adequate supply of product candidates for our trials;
- the number of clinical sites included in the trials;
- the length of time required to enroll suitable patients;
- the number of patients that ultimately participate in the trials;
- the number of doses patients receive;
- any side effects associated with our product candidates;
- the impacts of the COVID-19 pandemic on our ability to initiate trial sites, enroll and assess patients, supply study drug and report trial results;
- the duration of patient follow-up; and
- the results of our clinical trials.

Our expenditures are subject to additional uncertainties, including the terms and timing of regulatory approvals, and the expense of filing, prosecuting, defending and enforcing any patent claims or other intellectual property rights. We may never succeed in achieving regulatory approval for our product candidates. We may obtain unexpected results from our clinical trials. We may elect to discontinue, delay or modify clinical trials of our product candidates. A change in the outcome of any of these variables with respect to the development of a product candidate could mean a significant change in the costs and timing associated with the development of that product candidate. For example, if the FDA or other regulatory authorities were to require us to conduct clinical trials beyond those that we currently anticipate, or if we experience significant delays in enrollment in any of our clinical trials, we could be required to expend significant additional financial resources and time on the completion of clinical development. Product commercialization will take several years and millions of dollars in development costs.

General and Administrative Expense

General and administrative expense consists principally of salaries and related costs for personnel in executive and administrative functions, including stock-based compensation, travel expenses and recruiting expenses. Other general and administrative expense includes professional fees for legal, accounting and tax-related services and insurance costs.

We anticipate that our general and administrative expense will increase as we continue to operate as a public reporting company and continue to develop bentracimab, pemziviptadil, PB6440 and our future product candidates. We believe that these increases likely will include increased costs for director and officer liability insurance, costs related to the hiring of additional personnel and increased fees for outside consultants, lawyers and accountants. We also expect to incur increased costs to comply with corporate governance, internal controls, investor relations, disclosure and similar requirements applicable to public reporting companies.

Loss From Remeasurement of Development Derivative Liability

Loss from remeasurement of development derivative liability reflects the revaluation at each reporting date of our development derivative liability based on the present value of the estimated consideration to be received and the estimated consideration to be paid pursuant to the contractual terms under the SFJ Agreement, which is determined to be fair value. The liability is remeasured at the end of each quarter as a Level 3 derivative, with the change in fair value recorded in the condensed statements of operations.

Interest Expense

Interest expense consists of interest expense on our term loan with SVB and WestRiver.

License, Co-Development and Other Agreements

MedImmune Limited License Agreement

In November 2017, we entered into an exclusive license agreement, or the MedImmune License, with MedImmune Limited, or MedImmune, a wholly owned subsidiary of AstraZeneca plc. Pursuant to the MedImmune License, MedImmune granted us an exclusive, worldwide license under certain patent rights owned or controlled by MedImmune to develop and commercialize any products covered by the MedImmune License, or the MedImmune Licensed Products, for the treatment, palliation, diagnosis or prevention of any human disorder or condition. Under the MedImmune License, we paid MedImmune an upfront fee of $0.1 million. We are also required to pay MedImmune: quarterly fees relating to technical services provided by MedImmune; up to $18.0 million in clinical and regulatory milestone fees, $3.0 million of which had been incurred as of December 31, 2020; up to $50.0 million in commercial milestone fees; and mid-single digit to low-teen royalty percentages on net sales of MedImmune Licensed Products, subject to reduction in specified circumstances. In addition, the MedImmune License offers an option for third-party product storage costs. From the inception of the MedImmune License through December 31, 2020, we have incurred costs of $3.6 million under the MedImmune License.

Co-Development Agreement with SFJ Pharmaceuticals

In January 2020, we entered into the SFJ Agreement, pursuant to which SFJ provides us funding to support the global development of bentracimab as a reversal agent for the antiplatelet drug ticagrelor in patients with uncontrolled major or life-threatening bleeding or requiring urgent surgery or an invasive procedure. In March 2020, we obtained the consent of Silicon Valley Bank, or SVB, to grant SFJ a security interest in all of the assets owned or controlled by us that are necessary for the manufacture, use or sale of bentracimab. Under the SFJ Agreement, SFJ has agreed to pay us up to $120.0 million to support the clinical development of bentracimab. From the inception of the SFJ Agreement through December 31, 2020, SFJ has provided funding and paid for amounts on our behalf in the aggregate amount of $47.1 million. In addition, we expect that SFJ will fund or reimburse an additional $42.9 million of clinical trial costs and other expenses pursuant to the SFJ Agreement. SFJ will also provide up to an additional $30.0 million of funding upon the achievement of specified milestones with respect to our clinical development of bentracimab. During the term of the SFJ Agreement, we will have primary responsibility for clinical development and regulatory activities for bentracimab in the United States and the European Union, while SFJ will have primary responsibility for clinical development and regulatory activities for bentracimab in China and Japan and will provide clinical trials operational support in the European Union.

Under the terms of the SFJ Agreement, following the FDA approval of a BLA for bentracimab, we will pay SFJ an initial payment of $5.0 million and an additional $325.0 million in the aggregate in seven additional annual payments. If the EMA or the national regulatory authority in certain European countries approve a BLA for bentracimab, we will pay SFJ an initial payment of $5.0 million and an additional $205.0 million in the aggregate in seven additional annual payments. If either the PMDA of Japan or the NMPA of China approves a marketing application for bentracimab, we will pay SFJ an initial payment of $1.0 million and then an additional $59.0 million in the aggregate in eight additional annual payments.

Within 120 days following approval of a BLA for bentracimab in one of the jurisdictions described above, we have the right, at our option, to make a one-time cash payment to SFJ to buy out all or a portion of the future unpaid approval payments for such jurisdiction (i.e., the U.S. Approval Payments, EU Approval Payments or Japan/China Approval Payments,

as applicable) for a price reflecting a mid-single-digit discount rate. Within 120 days following a change of control of our company, we or our successor have the right, at its option, to make a one-time cash payment to SFJ to buy out all or a portion of the future unpaid approval payments in any of the jurisdictions in which a BLA for bentracimab was approved prior to the change of control for a price reflecting a mid-single-digit discount rate, provided that SFJ has not previously assigned the right to receive such payments to a third party (in which event we or our successor shall not have such right).

If following termination of the SFJ Agreement we continue to develop bentracimab and obtain BLA approval in the United States, the European Union, Japan or China, we will make the applicable approval payments for such jurisdiction to SFJ as if the SFJ Agreement had not been terminated, less any payments made upon termination, except that if we terminate the SFJ Agreement for SFJ's failure to make any payment to us when due, or SFJ terminates the SFJ Agreement due to a material adverse event, as defined in the SFJ Agreement, then our obligation to make such approval payments would be reduced by 50%.

Duke License Agreement

In October 2006, we entered into an exclusive license agreement with Duke University, or Duke, which was most recently amended in April 2019, or the Duke License. Pursuant to the Duke License, Duke granted us an exclusive, worldwide license under certain patent rights owned or controlled by Duke, and a non-exclusive, worldwide license under certain know-how of Duke, to develop and commercialize any products covered by the Duke License, or Duke licensed products, relating to ELPs. Under the Duke License, we paid Duke an upfront fee of $37,000, additional fees in connection with amendments to the Duke License of $0.2 million and other additional licensing fees of $0.2 million. In consideration for license rights granted to us, we initially issued Duke 24,493 shares of our common stock. Until we reached a certain stipulated equity milestone, which we reached in October 2007, we were obligated to issue additional shares of common stock to Duke from time to time so that its aggregate ownership represented 7.5% of our issued and outstanding capital stock. We are also required to pay Duke: up to $2.2 million in regulatory and clinical milestone fees; up to $0.4 million in commercial milestone fees; low single-digit royalty percentages on net sales of Duke licensed products, with minimum aggregate royalty payments of $0.2 million payable following our achievement of certain commercial milestones; and up to the greater of $0.3 million or a low double-digit percentage of the fees we receive from a third party in consideration of forming a strategic alliance with respect to certain patent rights covered under the Duke License. We also must pay Duke the first $1.0 million of non-royalty payments we receive from a sublicensee, and thereafter a low double-digit percentage of any additional nonroyalty payments we receive, subject to certain conditions. From the inception of the Duke License through December 31, 2020, we have incurred royalty costs of $0.3 million under the Duke License. We are also required to apply for, prosecute and maintain all U.S. and foreign patent rights under the Duke License.

Wacker License Agreement

In April 2019, we entered into a license agreement, or the Wacker License Agreement, with Wacker Biotech GmbH, or Wacker, pursuant to which Wacker granted us an exclusive license under certain of Wacker's intellectual property rights to use Wacker's proprietary *E. coli* strain for the manufacture of bentracimab worldwide outside of specified Asian countries and to commercialize bentracimab, if approved, manufactured by us or on our behalf using Wacker's proprietary *E. coli* strain throughout the world. We have the right to grant sublicenses under the license, subject to certain conditions as specified in the Wacker License Agreement. Under the terms of the agreement, we are required to pay a fixed, nominal per-unit royalty, which is subject to adjustment, and an annual license fee in a fixed Euro amount in the low to mid six digits. The agreement will be in force for an indefinite period of time, and upon the expiration of our royalty obligations, the license will be considered fully paid and will convert to a non-exclusive license. Either party may terminate the Wacker License Agreement for breach if such breach is not cured within a specified number of days. From the inception of the Wacker License Agreement through December 31, 2020, we have incurred $0.5 million in costs.

Viamet Asset Purchase Agreement

In January 2020, we entered into the PB6440 Agreement with Viamet Pharmaceuticals Holdings, LLC and its wholly-owned subsidiary, Selenity Therapeutics (Bermuda), Ltd., or the Sellers, pursuant to which we acquired all of the assets and intellectual property rights related to the Sellers' proprietary CYP11B2 inhibitor compound, formerly known as SE-6440 or VT-6440, and certain other CYP11B2 inhibitor compounds that are covered by the patent rights acquired by us under the PB6440 Agreement, or together, Compounds. Under the terms of the PB6440 Agreement, we paid the Sellers an upfront fee of $0.1 million upon the closing of the transaction, and we are required to pay the Sellers up to $5.1 million upon the achievement of certain development and intellectual property milestones with respect to certain product candidates that contain a Compound, up to $142.5 million upon the achievement of certain commercial milestones with respect to any approved product that contains a Compound and low- to mid-single digit royalty percentages on the net sales of approved products that contain a Compound,

subject to customary reductions and offsets in specified circumstances. We incurred $0.1 million in costs under the PB6440 Agreement for the year ended December 31, 2020.

BioVectra Supply Agreement

In March 2021, we entered into a supply agreement, or the BioVectra Agreement, with BioVectra Inc., or BioVectra, for the manufacture and supply by BioVectra of bulk drug substance for bentracimab for commercial distribution following regulatory approval, if obtained. Under the terms of the BioVectra Agreement, BioVectra has committed to maintaining capacity to manufacture an agreed number of batches of product each year, and we have committed to purchase a specified minimum number of batches of product per year, or the Minimum Annual Commitment, although we are free to contract with third parties for the manufacture of bentracimab.

We will pay a supply price per batch of product to be determined after the manufacturing process for the product is validated in accordance with the BioVectra Agreement, or Validation, plus the cost of certain consumables, raw materials, and third-party testing. Pursuant to the Minimum Annual Commitments, we are obligated to purchase a minimum of (i) approximately $14.0 million of batches of product in years 2022 through 2023, (ii) approximately $37.0 million of batches of product in 2024, and (iii) approximately $48.0 million of batches of product in each of years 2025 through 2031. In the event we do not purchase the applicable Minimum Annual Commitment in a given year, we will be obligated to make a payment to BioVectra in an amount equal to the then-applicable supply price per batch multiplied by the difference between the Minimum Annual Commitment for such year and the number of batches of product we actually purchased in such year, or the Minimum Shortfall Payment, except in the event that BioVectra was unable to deliver the number of batches ordered by us in such year. In the event of certain serious or extended failures by BioVectra to supply product in the quantities ordered by us in a given year, our Minimum Annual Commitment for such year (and potentially one or more subsequent years) will be subject to reduction, and our obligation to make a Minimum Shortfall Payment for such year (and potentially one or more subsequent years) will be waived. We will have the right to reduce the Minimum Annual Commitments for the year 2026 and subsequent years by up to a specified maximum percentage per year. Further, if we are only able to obtain regulatory approval for products incorporating bentracimab in only one of the U.S. or Europe, BioVectra and we have agreed to discuss in good faith an amendment to the BioVectra Agreement to reflect decreased requirements for product and impacts to the supply price to reflect lower volume commitments.

Results of Operations

Comparison of the Years Ended December 31, 2020 and 2019

The following table summarizes our results of operations for the years ended December 31, 2020 and 2019 (in thousands):

	Year Ended December 31,		
	2020	2019	Change
Revenue:			
Grant revenue	$ 320	$ 1,786	$ (1,466)
Revenue under collaborative agreement	—	575	(575)
Total revenue	320	2,361	(2,041)
Operating expenses:			
Research and development	72,088	30,911	41,177
General and administrative	13,088	11,186	1,902
Total operating expenses	85,176	42,097	43,079
Loss from operations	(84,856)	(39,736)	(45,120)
Other (expense) income:			
Loss from remeasurement of development derivative liability	(12,507)	—	(12,507)
Interest income	237	1,582	(1,345)
Interest expense	(1,445)	(1,076)	(369)
Foreign exchange gain (loss)	6	(17)	23
Total other (expense) income	(13,709)	489	(14,198)
Net loss	$ (98,565)	$ (39,247)	$ (59,318)

Revenue

Grant revenue was $0.3 million for the year ended December 31, 2020, compared to $1.8 million for the year ended December 31, 2019. The decrease was due to lower amounts available for grant reimbursement under our government grants during the year ended December 31, 2020. We have received all $2.8 million in funding available under the Small Business Innovation Research grants received from the National Institutes of Health to support the clinical development of pemziviptadil for the treatment of PAH. Revenue under collaborative agreement was zero for the year ended December 31, 2020, compared to $0.6 million for the year ended December 31, 2019. The decrease of $0.6 million was related to revenue we received from our agreement with ImmunoForge, which was entered into in 2019.

Research and Development Expense

Research and development expense was $72.1 million for the year ended December 31, 2020, compared to $30.9 million for the year ended December 31, 2019. The increase of $41.2 million was primarily attributable to increases in clinical and drug production activities related to bentracimab and pemziviptadil, personnel costs due to additional headcount and costs associated with our general research efforts.

The following table summarizes our research and development expense by functional area for the years ended December 31, 2020 and 2019 (in thousands):

	Year Ended December 31,		
	2020	2019	Change
Preclinical and clinical development	$ 62,166	$ 24,368	$ 37,798
Compensation and related benefits	7,023	4,725	2,298
Stock-based compensation	643	286	357
Facilities expense	1,149	766	383
Other	1,107	766	341
Total research and development expense	$ 72,088	$ 30,911	$ 41,177

The following table summarizes our research and development expense by product candidate for the years ended December 31, 2020 and 2019 (in thousands):

	Year Ended December 31,		
	2020	2019	Change
External research and development expense by program			
Bentracimab	$ 48,539	$ 16,660	$ 31,879
Pemziviptadil	12,284	6,069	6,215
Unallocated research and development expense:			
Compensation and stock-based compensation	7,666	5,011	2,655
Other research and development	3,599	3,171	428
Total research and development expense	$ 72,088	$ 30,911	$ 41,177

General and Administrative Expense

General and administrative expense was $13.1 million for the year ended December 31, 2020, compared to $11.2 million for the year ended December 31, 2019. The increase of $1.9 million was primarily attributable to increases in personnel expense due to additional headcount, directors and officers liability insurance and professional services related to consulting and legal services.

Loss From Remeasurement of Derivative Liability

Loss from remeasurement of derivative liability was $12.5 million for the year ended December 31, 2020. The liability was initially recorded at the present value of the estimated consideration to be received and the estimated consideration to be paid pursuant to the contractual terms of the SFJ Agreement, which was determined to have been fair value. The derivative liability was subsequently remeasured at year end as a Level 3 derivative.

Interest Income

Interest income was $0.2 million for the year ended December 31, 2020, compared to $1.6 million for the year ended December 31, 2019. The decrease of $1.3 million was attributable to higher balances of cash and cash equivalents and higher interest rates during 2019.

Interest Expense

Interest expense was $1.4 million for the year ended December 31, 2020, compared to $1.1 million for the year ended December 31, 2019. The increase of $0.4 million was attributable to increased borrowings in 2020 under the 2019 Loan.

Liquidity and Capital Resources

Since our inception, we have not generated any revenue from product sales and have incurred net losses and negative cash flows from our operations. We have financed our operations primarily through public offerings of our common stock, private placements of convertible debt and convertible preferred stock and borrowings under our term loans. In future periods we expect SFJ to provide up to an additional $72.9 million of funding pursuant to the SFJ Agreement, $30.0 million of which we are eligible to receive upon the achievement of specified milestones with respect to our clinical development of bentracimab. As of December 31, 2020, we had cash and cash equivalents of $28.1 million.

In March 2019, we entered into the 2019 Loan with SVB and WestRiver, pursuant to which we could borrow up to $15.0 million, issuable in three separate tranches. As of December 31, 2020, we had drawn on all three tranches under the 2019 Loan in the amounts of $7.5 million, $2.5 million and $5.0 million.

In April 2019, we completed an underwritten public offering of our common stock, which resulted in the issuance and sale of an aggregate of 4,124,475 shares of common stock at a public offering price of $12.00 per share, generating net proceeds of $46.3 million after deducting underwriting discounts and commissions and other offering costs.

In December 2019, we filed a shelf registration statement on Form S-3, or the 2019 Shelf Registration Statement, which became effective in January 2020. The 2019 Shelf Registration Statement permits: (i) the offering, issuance and sale by us of up to a maximum aggregate offering price of $200.0 million of common stock, preferred stock, debt securities and warrants in one or more offerings and in any combination; and (ii) the offering, issuance and sale by us of up to a maximum aggregate offering price of $60.0 million of our common stock that may be issued and sold under an "at-the-market" sales agreement, or ATM Program, with Citigroup Global Markets Inc. and William Blair & Company, L.L.C. During the year ended December 31, 2020, we raised gross proceeds of $2.9 million pursuant to the ATM Program from the sale of 561,848 shares of our common stock at a weighted-average price of $5.41 per share. We have $197.1 million of common stock remaining that can be sold under the 2019 Shelf Registration Statement, of which $57.1 million may be sold under the ATM Program.

In January 2020, we entered into the SFJ Agreement, pursuant to which SFJ agreed to provide funding to support the development of bentracimab as a reversal agent for the antiplatelet drug ticagrelor. Under the SFJ Agreement, SFJ has agreed to pay us up to $120.0 million to support the clinical development of bentracimab. From the inception of the SFJ Agreement through December 31, 2020, SFJ has provided funding and paid for amounts on our behalf in the aggregate amount of $47.1 million. In addition, we expect that SFJ will fund or reimburse an additional $42.9 million of clinical trial costs and other expenses. We are also eligible to receive up to an additional $30.0 million of funding upon the achievement of specific clinical development milestones with respect to our ongoing REVERSE-IT trial of bentracimab.

The following table summarizes our cash flows for each of the periods set forth below (in thousands):

	Year Ended December 31,	
	2020	2019
Net cash used in operating activities	$ (59,957)	$ (39,594)
Net cash used in investing activities	(1,412)	(960)
Net cash provided by financing activities	15,466	53,528
Net (decrease) increase in cash and cash equivalents	$ (45,903)	$ 12,974

Operating Activities

Net cash used in operating activities was $60.0 million during the year ended December 31, 2020. The use of cash primarily related to our net loss of $98.6 million, in addition to a $4.3 million change in our operating assets and liabilities. The use of cash was partially offset by non-cash expenses, primarily $27.0 million in research and development expenses paid for

on our behalf by SFJ, $12.5 million from the loss from remeasurement of development derivative liability and $2.2 million in stock-based compensation. The change in our operating assets and liabilities was principally due to an $8.4 million increase in prepaid expenses as a result of drug manufacturing payments related to bentracimab, partially offset by increases of $1.9 million in accrued expenses and $1.0 million in accounts payable and by a $1.2 million decrease in other receivables due to timing of the receipt of grant revenue.

Net cash used in operating activities was $39.6 million during the year ended December 31, 2019. The use of cash primarily related to our net loss of $39.2 million, adjusted for non-cash charges primarily related to $1.4 million in stock-based compensation expense, $0.5 million for non-cash interest expense and a $2.4 million change in our operating assets and liabilities. The change in our operating assets and liabilities was principally due to a $2.0 million increase in prepaid expense and other assets and an increase in other receivables of $1.0 million, partially offset by a $0.8 million increase in accounts payable, all as a result of increased clinical activities for our ongoing clinical trials of bentracimab and pemziviptadil.

Investing Activities

Net cash used in investing activities was $1.4 million for the purchase of property and equipment and the acquisition of intellectual property rights during the year ended December 31, 2020. Net cash used in investing activities was $1.0 million for the purchase of property and equipment during the year ended December 31, 2019.

Financing Activities

Net cash provided by financing activities was $15.5 million during the year ended December 31, 2020, due primarily to the receipt of $15.2 million under the SFJ Agreement and $2.9 million in proceeds from sales under the ATM Program, partially offset by $2.7 million in repayments of long-term debt. Net cash provided by financing activities was $53.5 million during the year ended December 31, 2019, due primarily to the receipt of $46.3 million in net proceeds from the April 2019 underwritten public offering and borrowings of $8.1 million on the 2019 Loan, partially offset by $0.9 million for partial repayment of the SVB Loan.

Funding Requirements

To date, we have not generated any revenues from the commercial sale of approved drug products, and we do not expect to generate substantial revenues for at least the next several years. If we fail to complete the development of our product candidates in a timely manner or fail to obtain their regulatory approval, our ability to generate future revenue will be compromised. We cannot guarantee when, or if, we will generate any revenue from our product candidates, and we do not expect to generate significant revenue unless and until we obtain regulatory approval of, and commercialize, our product candidates. We expect our expenses to increase in connection with our ongoing activities, particularly as we continue the research and development of, continue or initiate clinical trials of, and seek marketing approval for, our product candidates. In addition, if we obtain approval for any of our product candidates, we expect to incur significant commercialization expenses related to sales, marketing, manufacturing and distribution. We anticipate that we will need 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 future commercialization efforts.

We have experienced net losses and negative cash flows from operations and, as of December 31, 2020, had an accumulated deficit of $260.7 million. We expect to continue to incur net losses for at least the next several years. We believe that our existing cash and cash equivalents as of December 31, 2020, in addition to the $42.9 million of clinical trial costs and other expenses that we expect SFJ will fund or reimburse, will not be sufficient to fund our operating expenses and capital requirements for 12 months from the date of the issuance of the financial statements included in this Annual Report on Form 10-K. These factors raise substantial doubt about our ability to continue as a going concern. See Risk Factors—"The auditor's opinion on our audited financial statements for the fiscal year ended December 31, 2020 included in this Annual Report on Form 10-K contains an explanatory paragraph relating to our substantial doubt about our ability to continue as a going concern. Further, under the SFJ Agreement, SFJ may elect to have our business related to bentracimab transferred to SFJ if we do not remedy such going concern condition within the periods specified in the agreement and our ability to share in any revenues from the commercialization of bentracimab will be materially and adversely affected." We intend to devote our existing cash and cash equivalents to advance our clinical and preclinical development programs. We have based our estimates on assumptions that may prove to be wrong, and we may use our available capital resources sooner than we currently expect. Because of the numerous risks and uncertainties associated with the development and commercialization of product candidates, we are unable to estimate the amounts of increased capital outlays and operating expenditures necessary to complete the development of product candidates.

We plan to address our liquidity needs through the pursuit of additional funding through a combination of equity or debt financings, or government or other third-party financing, marketing and distribution agreements and other collaborations, strategic alliances and licensing agreements. There is no assurance that we will be able to obtain additional funding on acceptable terms or at all. If we are not able to secure adequate additional funding, we will be required to make reductions in certain spending to extend our current funds. If we are unable to raise adequate funds, we may have to liquidate some or all of our assets, or we may have to delay, reduce the scope of, or eliminate some or all of our development programs or clinical trials. We may also have to delay development or commercialization of our products or license to third parties the rights to commercialize products or technology that we would otherwise seek to commercialize. Further, under the SFJ Agreement, if we fail to remedy such going concern condition within the periods specified in the agreement, SFJ may elect to have our business related to bentracimab transferred to SFJ. If our business related to bentracimab is transferred to SFJ, we will not share in any revenues from the commercialization of bentracimab until SFJ has received a 300% return on its investment in bentracimab, after which we will be entitled to a mid-single-digit royalty on net sales of bentracimab in the United States and certain European countries, and after SFJ has received an aggregate 500% return on its investment in bentracimab, we will be entitled to a mid-single-digit royalty on net sales of bentracimab in the rest of the world. Any of these factors could harm our operating results and future prospects.

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

- the progress and results of our ongoing and planned future clinical trials of bentracimab, pemziviptadil, PB6440 and our other preclinical programs;
- the timing and amount of payments we receive under the SFJ Agreement;
- the scope, progress, results and costs of preclinical development, laboratory testing and clinical trials for any future product candidates we may decide to pursue;
- the extent to which we develop, in-license or acquire other product candidates and technologies;
- the number and development requirements of other product candidates that we may pursue;
- the costs, timing and outcome of regulatory review of our product candidates;
- the costs and timing of future commercialization activities, including product manufacturing, marketing, sales and distribution, for any of our product candidates for which we receive marketing approval;
- the revenue, if any, received from commercial sales of our product candidates for which we receive marketing approval;
- our ability to establish collaborations to commercialize pemziviptadil in the United States;
- our ability to establish collaborations to commercialize bentracimab, pemziviptadil or any of our other product candidates outside of the United States; and
- the costs and timing of preparing, filing and prosecuting patent applications, maintaining and enforcing our intellectual property rights and defending any intellectual property-related claims.

Identifying potential product candidates and conducting preclinical studies and clinical trials is a time-consuming, expensive and uncertain process that takes many years to complete, and we may never generate the necessary data or results required to obtain marketing approval and achieve product sales. In addition, our product candidates, if approved, may not achieve commercial success. Our commercial revenues, if any, will be derived from sales of product candidates that we do not expect to be commercially available in the near term, if at all.

Our future commercial revenue, if any, will be derived from sales of products that we do not expect to be commercially available for several 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. To the extent that we raise additional capital through the sale of equity or convertible debt securities, the terms of these equity securities or this debt may restrict our ability to operate. Any future debt financing and equity financing, if available, may involve agreements that include covenants limiting and restricting our ability to take specific actions, such as incurring additional debt, making capital expenditures, entering into profit-sharing or other arrangements or declaring dividends. If we raise additional funds through government or private grants, collaborations, strategic alliances or marketing, distribution or licensing arrangements with third parties, we may be required to relinquish valuable rights to our technologies, future revenue streams, research programs or product candidates or to grant licenses on terms that may not be favorable to us. Further, our ability to raise additional capital may be adversely impacted by potential worsening global economic conditions and the recent

disruptions to, and volatility in, the credit and financial markets in the United States and worldwide resulting from the ongoing COVID-19 pandemic.

Off-Balance Sheet Arrangements

We did not have during the periods presented, and we do not currently have, any off-balance sheet arrangements, as defined in the SEC rules and regulations.

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 financial statements, which have been prepared in accordance with United States generally accepted accounting policies, or GAAP. The preparation of these financial statements requires us to make estimates, judgments and assumptions that affect the reported amounts of assets and liabilities, disclosure of contingent assets and liabilities as of the dates of the balance sheets and the reported amounts of expenses during the reporting periods. In accordance with GAAP, we evaluate our estimates and judgments on an ongoing basis.

Significant estimates include assumptions we have used in the determination of accrued research and development costs. 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.

We believe the following accounting policies are the most critical to the judgments and estimates used in the preparation of our financial statements. See Note 2 to the financial statements appearing elsewhere in this Annual Report for a discussion of our significant accounting policies.

Accrued Research and Development Expense

The majority of our operating expenses to date have been incurred in research and development activities. As part of the process of preparing our financial statements, we are required to estimate expenses resulting from obligations under contracts with vendors, consultants and research organizations, in connection with conducting clinical and preclinical activities. The financial terms of these contracts are subject to negotiations which vary from contract to contract and may result in payment flows that do not match the periods over which materials or services are provided under such contracts. We reflect preclinical study and clinical trial expenses in our financial statements by matching those expenses with the period in which services and efforts are expended. We account for these expenses according to the progress of the preclinical study or clinical trial as measured by the timing of various aspects of the preclinical study or clinical trial, or related activities. Our accrual estimates are determined through review of the underlying contracts along with preparation of financial models taking into account discussions with research and other key personnel as to the progress of preclinical studies or clinical trials, or other services being conducted. During the course of a preclinical study or clinical trial, we will adjust the rate of expense recognition if actual results differ from our original estimates.

Development Derivative Liability

In January 2020, we entered into the SFJ Agreement, pursuant to which SFJ provides funding to support the global development of bentracimab as a reversal agent for the antiplatelet drug ticagrelor in patients with uncontrolled major or life-threatening bleeding or requiring urgent surgery or an invasive procedure. Under the SFJ Agreement, SFJ has agreed to pay us up to $120.0 million to support the clinical development of bentracimab.

If the FDA approves a BLA for bentracimab, we have agreed to pay to SFJ an initial payment of $5.0 million and an additional $325.0 million in the aggregate in seven additional annual payments, or the U.S. Approval Payments. If the EMA or the national regulatory authorities in certain European countries provide marketing approval of bentracimab, we will pay SFJ an initial payment of $5.0 million and an additional $205.0 million in the aggregate in seven additional annual payments, or the EU Approval Payments. The majority of the U.S. Approval Payments and the EU Approval Payments will be made from the third anniversary to the seventh anniversary of marketing approval in the applicable jurisdiction. If either the Pharmaceuticals and Medical Devices Agency, or the PMDA, of Japan or the National Medical Products Administration, or the NMPA, of China provides marketing approval of bentracimab, we will pay SFJ an initial payment of $1.0 million and then an additional $59.0 million in the aggregate in eight additional annual payments, or the Japan/China Approval Payments, with the majority of the payments to be made from the fifth anniversary to the eighth anniversary of marketing approval. The Japan/China Approval Payments will only be paid once regardless of receipt of marketing approval in both Japan and China. The U.S. Approval

Payments, EU Approval Payments and Japan/China Approval Payments will be proportionately adjusted in the event that the actual funding from SFJ is lower or greater than $120.0 million. We will not be obligated to make the U.S. Approval Payments if we do not receive marketing approval for bentracimab from the FDA, the EU Approval Payments if we do not receive marketing approval for bentracimab from the EMA or the national regulatory authority in certain European countries or the Japan/China Approval Payments if we do not receive marketing approval for bentracimab from either the PMDA or the NMPA.

We account for the SFJ Agreement as a derivative instrument that increases and decreases as consideration is received and repayments are made, respectively. The derivative is further adjusted at each reporting period to its estimated fair value. The derivative is valued using a scenario-based discounted cash flow method, whereby each scenario makes assumptions about the probability and timing of cash flows, and such cash flows are present valued using a risk-adjusted discount rate. The valuation method incorporates certain unobservable Level 3 key inputs including (i) the probability and timing of funding, (ii) the probability and timing of achieving regulatory approvals, (iii) our cost of borrowing (16.00% plus the risk free borrowing rate) and (iv) SFJ's cost of borrowing (2.50% plus the risk free borrowing rate). The derivative is presented as a liability in our balance sheet. Any changes in fair value are recorded as a loss or gain from remeasurement of development derivative liability on the statements of operations.

If actual results or events differ materially from the estimates, judgments and assumptions used by us in applying these policies, our reported financial condition and results of operations could be materially affected.

Recent Accounting Pronouncements

See Note 2 to the financial statements appearing elsewhere in this Annual Report for information concerning recent accounting pronouncements.

JOBS Act Transition Period

In April 2012, the JOBS Act was enacted. Section 107 of the JOBS Act provides that an “emerging growth company” can take advantage of the extended transition period provided in Section 7(a)(2)(B) of the Securities Act for complying with new or revised accounting standards. Thus, an emerging growth company can 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 extended transition period and, as a result, we will adopt new or revised accounting standards on the relevant dates on which adoption of such standards is required for other public companies.

We are in the process of evaluating the benefits of relying on other exemptions and reduced reporting requirements under the JOBS Act. Subject to certain conditions, as an emerging growth company, we may rely on certain of these exemptions, including without limitation, (i) not providing an auditor’s attestation report on our system of internal controls over financial reporting pursuant to Section 404(b) of the Sarbanes-Oxley Act and (ii) not complying with any requirement that may be adopted by the Public Company Accounting Oversight Board. We will remain an emerging growth company until the earliest to occur of (1) the last day of the fiscal year (a) ending December 31, 2023, which is the end of the fiscal year following the fifth anniversary of the completion our initial public offering, (b) in which we have total annual gross revenues of at least $1.07 billion or (c) in which we are deemed to be a “large accelerated filer” under the rules of the SEC, which means the market value of our common stock that is held by non-affiliates exceeds $700 million as of the prior June 30th, and (2) the date on which we have issued more than $1.0 billion in non-convertible debt during the prior three-year period.

We are a “smaller reporting company” (and may continue to qualify as such even after we no longer qualify as an emerging growth company) and accordingly may provide less public disclosure than larger public companies, including the inclusion of only two years of audited financial statements and only two years of related selected financial data and management’s discussion and analysis of financial condition and results of operations disclosure. As a result, the information that we provide to our stockholders may be different than what they might receive from other public reporting companies in which they hold equity interests.

Effect of Inflation

Inflation did not have a significant impact on our net sales, revenues or income from continuing operations in 2020 or 2019.

Item 7A. Quantitative and Qualitative Disclosures About Market Risk.

We are a smaller reporting company as defined by Rule 12b-2 of the Exchange Act and are not required to provide the information required under this item.

Item 8. Financial Statements and Supplementary Data.

The information required by this Item 8 is set forth in our financial statements included in Part IV, Item 15 of this Annual Report on Form 10-K.

Item 9. Changes in and Disagreements With Accountants on Accounting and Financial Disclosure.

None.

Item 9A. Controls and Procedures.

Disclosure Controls and Procedures

We maintain "disclosure controls and procedures," as such term is defined in Rules 13a-15(e) and 15d-15(e) under the Exchange Act, that are designed to ensure that information required to be disclosed by us in reports that we file or submit under the Exchange Act is recorded, processed, summarized and reported within the time periods specified in SEC rules and forms, and that such information is accumulated and communicated to our management, including our principal executive and our principal financial officers, as appropriate, to allow timely decisions regarding required disclosure.

With respect to the year ended December 31, 2020, under the supervision and with the participation of our management, we conducted an evaluation of the effectiveness of the design and operations of our disclosure controls and procedures. Based upon this evaluation, our Chief Executive Officer and Chief Financial Officer have concluded that our disclosure controls and procedures were effective as of December 31, 2020 to provide reasonable assurance that the information required to be disclosed by us in this Annual Report was (a) reported within the time periods specified by SEC rules and regulations and (b) communicated to our management, including our Chief Executive Officer and Chief Financial Officer, to allow timely decisions regarding any required disclosure.

Management's Report on Internal Control Over Financial Reporting

Our management is responsible for establishing and maintaining adequate internal control over financial reporting. Internal control is defined in Rules 13a-15(f) and 15d-15(f) promulgated under the Exchange Act as a process designed by, or under the supervision of, the company's principal executive and principal financial officers and effected by the company's board of directors, management and other personnel, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles and includes those policies and procedures that:

- Pertain to the maintenance of records that in reasonable detail accurately and fairly reflect the transactions and dispositions of the assets of the company;
- Provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and
- Provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use or disposition of the company's assets that could have a material effect on the financial statements.

Our management assessed the effectiveness of our internal control over financial reporting as of December 31, 2020. In making this assessment, management used the criteria set forth by the Committee of Sponsoring Organizations of the Treadway Commission in *Internal Control - Integrated Framework* (2013 framework) (COSO). Based on its assessment, management believes that, as of December 31, 2020, our internal control over financial reporting is effective at the reasonable assurance level.

This Annual Report does not include an attestation report of our independent registered public accounting firm as allowed by the SEC's transition period for emerging growth companies.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Therefore, even those systems determined to be effective can provide only reasonable assurance with respect to financial statement preparation and presentation. Projections of any evaluation of effectiveness to future periods are subject to

the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

Changes in Internal Control over Financial Reporting

There were no changes in our internal control over financial reporting (as defined in Rules 13a-15(f) and 15d-15(f) under the Exchange Act) that occurred during the fiscal year ended December 31, 2020 which have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

Item 9B. Other Information.

None.

PART III

We intend to file a definitive Proxy Statement for our 2021 Annual Meeting of Stockholders, or the Proxy Statement, with the SEC, pursuant to Regulation 14A, not later than 120 days after the end of our fiscal year. Accordingly, certain information required by Part III has been omitted under General Instruction G(3) to Form 10-K. Only those sections of the 2021 Proxy Statement that specifically address the items set forth herein are incorporated by reference.

Item 10. Directors, Executive Officers and Corporate Governance.

The information required by this Item 10 will be included in our Proxy Statement under the captions “Information Regarding the Board of Directors and Corporate Governance,” “Election of Directors,” “Executive Officers” and “Delinquent Section 16(a) Reports” and is incorporated herein by reference.

Item 11. Executive Compensation.

The information required by this Item 11 will be included in our Proxy Statement under the captions “Executive Compensation” and “Director Compensation” and is incorporated herein by reference.

Item 12. Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters.

The information required by this Item 12 will be included in our Proxy Statement under the captions “Security Ownership of Certain Beneficial Owners and Management” and “Securities Authorized for Issuance under Equity Compensation Plans” and is incorporated herein by reference.

Item 13. Certain Relationships and Related Transactions, and Director Independence.

The information required by this Item 13 will be included in our Proxy Statement under the captions “Transactions with Related Persons and Indemnification” and “Independence of the Board of Directors” and is incorporated herein by reference.

Item 14. Principal Accounting Fees and Services.

The information required by this Item 14 will be included in our Proxy Statement under the caption “Ratification of Selection of Independent Registered Public Accounting Firm” and is incorporated herein by reference.

PART IV

Item 15. Exhibits, Financial Statement Schedules.

(a)(1) Financial Statements

See the Index to Consolidated Financial Statements in Item 8 of this Annual Report on Form 10-K.

PhaseBio Pharmaceuticals, Inc.

Index to Financial Statements

Contents

Report of Independent Registered Public Accounting Firm

To the Stockholders and Board of Directors
PhaseBio Pharmaceuticals, Inc.:

Opinion on the Financial Statements

We have audited the accompanying balance sheets of PhaseBio Pharmaceuticals, Inc. (the Company) as of December 31, 2020 and 2019, the related statements of operations, stockholders' (deficit) equity, and cash flows for the years then ended, and the related notes (collectively, the financial statements). In our opinion, the financial statements present fairly, in all material respects, the financial position of the Company as of December 31, 2020 and 2019, and the results of its operations and its cash flows for each of the years then ended, in conformity with U.S. generally accepted accounting principles.

Going Concern

The accompanying 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 recurring losses and negative cash flows from operations and has an accumulated deficit of $260.7 million as of December 31, 2020 that raise substantial doubt about its ability to continue as a going concern. Management's plans in regard to these matters are also described in Note 1. The financial statements do not include any adjustments that might result from the outcome of this uncertainty.

Basis for Opinion

These financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on these financial statements based on our audits. 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 audits 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 audits, 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 audits 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 audits 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 audits provide a reasonable basis for our opinion.

/s/ KPMG LLP

We have served as the Company's auditor since 2010.

Philadelphia, Pennsylvania
March 15, 2021

PHASEBIO PHARMACEUTICALS, INC.
BALANCE SHEETS
(in thousands, except share and per share amounts)

	December 31, 2020	December 31, 2019
Assets		
Current assets:		
Cash and cash equivalents	$ 28,122	$ 74,025
Other receivables	—	1,233
Prepaid expenses and other assets	12,027	3,565
Total current assets	40,149	78,823
Property and equipment, net	8,224	1,924
Operating lease right-of-use assets	1,927	1,715
Other assets	57	32
Total assets	$ 50,357	$ 82,494
Liabilities and stockholders' (deficit) equity		
Current liabilities:		
Current portion of long-term debt	$ 5,355	$ 2,378
Accounts payable	3,674	2,921
Accrued expenses and other current liabilities	5,931	3,180
Total current liabilities	14,960	8,479
Long-term debt, net	6,773	12,326
Operating lease liabilities, net	1,548	1,508
Development derivative liability	51,719	—
Other long-term liabilities	559	203
Total liabilities	75,559	22,516
Commitments and contingencies (*Note 8*)		
Stockholders’ (deficit) equity:		
Preferred stock, $0.001 par value; 10,000,000 shares authorized; zero shares issued and outstanding at December 31, 2020 and 2019	—	—
Common stock, $0.001 par value; 200,000,000 shares authorized; 29,471,854 shares issued and 29,441,887 shares outstanding at December 31, 2020; 28,796,371 shares issued and 28,766,404 shares outstanding at December 31, 2019	29	29
Treasury stock, at cost, 29,967 shares as of December 31, 2020 and 2019	(24)	(24)
Additional paid-in capital	235,516	222,131
Accumulated deficit	(260,723)	(162,158)
Total stockholders’ (deficit) equity	(25,202)	59,978
Total liabilities and stockholders' (deficit) equity	$ 50,357	$ 82,494

See accompanying notes to financial statements.

PHASEBIO PHARMACEUTICALS, INC.
STATEMENTS OF OPERATIONS
(in thousands, except share and per share amounts)

	Year Ended December 31,	
	2020	**2019**
Revenue:		
Grant revenue	$ 320	$ 1,786
Revenue under collaborative agreement	—	575
Total revenue	320	2,361
Operating expenses:		
Research and development	72,088	30,911
General and administrative	13,088	11,186
Total operating expenses	85,176	42,097
Loss from operations	(84,856)	(39,736)
Other (expense) income:		
Loss from remeasurement of development derivative liability	(12,507)	—
Interest income	237	1,582
Interest expense	(1,445)	(1,076)
Foreign exchange gain (loss)	6	(17)
Total other (expense) income	(13,709)	489
Net loss	$ (98,565)	$ (39,247)
Net loss per common share, basic and diluted	$ (3.39)	$ (1.43)
Weighted-average common shares outstanding, basic and diluted	29,056,304	27,493,558

See accompanying notes to financial statements.

PHASEBIO PHARMACEUTICALS, INC.
STATEMENTS OF STOCKHOLDERS' (DEFICIT) EQUITY
(in thousands, except share amounts)

	Common Stock		Treasury Stock		Additional Paid-in	Accumulated	Total Stockholders' (Deficit)
	Shares	Amount	Shares	Amount	Capital	Deficit	Equity
Balance at December 31, 2018	24,528,242	$ 25	(29,967)	$ (24)	$ 173,837	$ (122,911)	$ 50,927
Issuance of common stock warrants	—	—	—	—	355	—	355
Issuance of common stock in public offering, net	4,124,475	4	—	—	46,273	—	46,277
Exercises of stock options	143,654	—	—	—	245	—	245
Stock-based compensation	—	—	—	—	1,421	—	1,421
Net loss	—	—	—	—	—	(39,247)	(39,247)
Balance at December 31, 2019	28,796,371	29	(29,967)	(24)	222,131	(162,158)	59,978
Issuance of common stock warrants	—	—	—	—	7,925	—	7,925
Issuance of common stock in public offering, net	561,848	—	—	—	2,942	—	2,942
Issuance of common stock through employee share purchase plan	62,063	—	—	—	186	—	186
Exercises of stock options	51,572	—	—	—	95	—	95
Stock-based compensation	—	—	—	—	2,237	—	2,237
Net loss	—	—	—	—	—	(98,565)	(98,565)
Balance at December 31, 2020	29,471,854	$ 29	(29,967)	$ (24)	$ 235,516	$ (260,723)	$ (25,202)

See accompanying notes to financial statements.

PHASEBIO PHARMACEUTICALS, INC.
STATEMENTS OF CASH FLOWS
(in thousands)

	Year Ended December 31	
	2020	2019
Operating activities		
Net loss	$ (98,565)	$ (39,247)
Adjustments to reconcile net loss to net cash used in operating activities:		
Depreciation and amortization	508	174
Stock-based compensation	2,237	1,421
Loss from remeasurement of development derivative liability	12,507	—
Non-cash interest expense	491	500
Non-cash research and development expense	27,027	—
Other non-cash transactions	100	—
Changes in operating assets and liabilities:		
Other receivables	1,233	(1,000)
Prepaid expenses and other assets	(8,375)	(1,954)
Accounts payable	974	802
Accrued expenses	1,906	(327)
Deferred rent	—	37
Net cash used in operating activities	(59,957)	(39,594)
Investing activities		
Purchases of property and equipment	(1,312)	(960)
Acquisition of intellectual property rights	(100)	—
Net cash used in investing activities	(1,412)	(960)
Financing activities		
Proceeds from development derivative liability	15,169	—
Proceeds from issuance of common stock, net	2,942	46,277
Payments of deferred stock offering costs	(199)	(145)
Long-term borrowings, net	—	8,089
Proceeds from exercise of stock options	95	245
Shares purchased through employee share purchase plan	186	—
Repayments of long-term debt	(2,727)	(938)
Net cash provided by financing activities	15,466	53,528
Net (decrease) increase in cash and cash equivalents	(45,903)	12,974
Cash, cash equivalents and restricted cash at the beginning of the year	74,025	61,051
Cash and cash equivalents at the end of the year	$ 28,122	$ 74,025
Supplemental disclosure for cash flow		
Cash paid for interest	$ 954	$ 576
Supplemental disclosure of cash flow information		
Accrued interest on term loan refinanced to principal	$ —	$ 308
Debt refinanced through new term loan	$ —	$ 6,563
Right-of-use assets obtained in exchange for new operating lease liabilities	$ 576	$ 1,991
Issuance of warrants in conjunction with development derivative liability	$ 7,925	$ —
Purchases of property and equipment in conjunction with development derivative liability	$ 4,941	$ —
Issuance of warrants in conjunction with debt	$ —	$ 355
Deferred stock offering costs in accounts payable	$ —	$ 110
Purchases of property and equipment included in accounts payable and accrued expenses	$ 1,378	$ 823

See accompanying notes to financial statements.

1. Organization and Description of Business

Description of Business

PhaseBio Pharmaceuticals, Inc. (the “Company”) was incorporated as a Delaware corporation on January 10, 2002. The Company is a clinical-stage biopharmaceutical company focused on the development and commercialization of novel therapies for cardiopulmonary diseases. The Company’s lead product candidate, bentracimab (also known as PB2452), is a novel reversal agent for the antiplatelet drug ticagrelor, which the Company is developing for the reversal of the antiplatelet effects of ticagrelor in patients with uncontrolled major or life-threatening bleeding or requiring urgent surgery or an invasive procedure. The Company’s second product candidate, pemziviptadil (also known as PB1046), is in Phase 2 development for the treatment of pulmonary arterial hypertension ("PAH"). Pemziviptadil utilizes the Company’s proprietary half-life extending elastin-like polypeptide technology, which also serves as an engine for the Company’s preclinical pipeline. The Company is also developing its preclinical product candidate, PB6440, for treatment-resistant hypertension.

Going Concern

The Company has experienced net losses and negative cash flows from operations and, as of December 31, 2020, had an accumulated deficit of $260.7 million. The Company expects to continue to incur net losses for at least the next several years. As of December 31, 2020, the Company had cash and cash equivalents of $28.1 million and working capital of $25.2 million. In January 2020, the Company entered into a co-development agreement ("SFJ Agreement") with SFJ Pharmaceuticals X, Ltd., an SFJ Pharmaceuticals Group company ("SFJ"), pursuant to which SFJ provides funding and operational support for the clinical development of bentracimab. Management believes that its existing cash and cash equivalents as of December 31, 2020, in addition to the $42.9 million in clinical trial costs and other expenses that the Company expects SFJ will fund or reimburse pursuant to the SFJ Agreement, will not be sufficient to fund operating expenses and capital requirements for 12 months from the date of the issuance of these financial statements. These factors raise substantial doubt about the Company's ability to continue as a going concern. The financial statements do not include any adjustments that might result from the outcome of this uncertainty. Under the SFJ Agreement, if the Company fails to remedy such going concern condition during the periods specified in the agreement, SFJ may elect to have the Company's business related to bentracimab transferred to SFJ.

The Company plans to address its liquidity needs through the pursuit of additional funding through a combination of equity or debt financings, or other third-party financing, marketing and distribution arrangements and other collaborations, strategic alliances and licensing arrangements. However, there is no assurance that these funding efforts will be successful. In this regard, the Company currently has an effective shelf registration statement on Form S-3 ("2019 Shelf Registration Statement") on file with the Securities and Exchange Commission ("SEC"), which expires in January 2023. The 2019 Shelf Registration Statement currently permits the offering, issuance and sale by the Company of up to an aggregate offering price of $200.0 million of common stock, preferred stock, debt securities and warrants in one or more offerings and in any combination, of which $60.0 million may be offered, issued and sold in "at-the-market" sales pursuant to an equity distribution agreement with Citigroup Global Markets Inc. and William Blair & Company, L.L.C (the "ATM Program"). During the year ended December 31, 2020, the Company sold 561,848 shares of common stock pursuant to the ATM Program for net proceeds of $2.9 million. As of December 31, 2020, the Company had $197.1 million of common stock remaining that can be sold under the 2019 Shelf Registration Statement, of which $57.1 million may be sold under the ATM Program.

The Company is continuing to assess the effect that the COVID-19 pandemic may have on its business and operations. The extent to which COVID-19 may impact the Company's business and operations will depend on future developments that are highly uncertain and cannot be predicted with confidence, such as the geographic distribution of the disease over time, the efficacy and availability of vaccines and antiviral agents against the disease, the continued duration of the outbreak, the duration and effect of business disruptions and the short-term effects and ultimate effectiveness of the travel restrictions, quarantines, social distancing requirements and business closures in the United States and other countries to contain and treat the disease. While the potential economic impact brought by, and the continued duration of, COVID-19 may be difficult to assess or predict, a continued and growing pandemic could result in significant disruption of global financial markets, reducing the Company's ability to access capital, which could in the future negatively affect its liquidity. In addition, a recession or market correction resulting from the spread of COVID-19 could materially affect the Company's business and the value of its common stock.

Basis of Presentation

The accompanying financial statements have been prepared in accordance with United States generally accepted accounting principles (“GAAP”) and the rules and regulations of the SEC. Any reference in these notes to applicable guidance

is meant to refer to GAAP as found in the Accounting Standards Codification ("ASC") and Accounting Standards Updates ("ASU") promulgated by the Financial Accounting Standards Board ("FASB").

The Company manages its operations as a single reportable segment for the purposes of assessing performance and making operating decisions.

2. Significant Accounting Policies

Use of Estimates

The preparation of the Company's financial statements requires management to make estimates and assumptions that impact the reported amounts of assets, liabilities, revenues and expenses and the disclosure of contingent assets and liabilities in the Company's financial statements and accompanying notes. The most significant estimates in the Company's financial statements relate to the valuation of the development derivative liability and the clinical trial accruals. 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.

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 certain deposits in federally insured financial institutions in excess of federally insured limits. The Company could experience losses on the money market funds in the future.

Cash and Cash Equivalents

The Company considers all highly liquid investments with an original maturity from the date of purchase of three months or less to be cash equivalents. Cash and cash equivalents include cash in readily available checking and money market accounts.

Fair Value of Financial Instruments

The carrying amounts of other receivables, prepaid expenses and other assets, accounts payable and accrued expenses and other current liabilities are reasonable estimates of their fair value because of the short maturity of these items. Based on the borrowing rates currently available to the Company for loans with similar terms, the Company believes the fair values of the term loan and operating lease liabilities and corresponding right-of-use assets approximate their respective carrying values.

Development Derivative Liability

Development derivative liability is recorded based on the present value of the estimated consideration to be received and the estimated consideration to be paid pursuant to contractual terms of the SFJ Agreement, which was determined to have been fair value. The liability is remeasured quarterly, as a Level 3 derivative, with any change in fair value recorded in the form of a gain (loss) from remeasurement of development derivative liability on the statements of operations

Property and Equipment

Property and equipment are recorded at cost and depreciated over the estimated useful lives of the assets (three to five years) using the straight-line method. Leasehold improvements are amortized over the shorter of their estimated useful lives or the lease term.

Leases

At lease commencement, the Company records a lease liability based on the present value of lease payments over the expected lease term including any options to extend the lease that the Company is reasonably certain to exercise. The Company calculates the present value of lease payments using an incremental borrowing rate as the Company's leases do not provide an implicit interest rate. The Company's incremental borrowing rate for a lease is the rate of interest it would have to pay on a collateralized basis to borrow an amount equal to the lease payments under similar terms. At the lease commencement date, the Company records a corresponding right-of-use lease asset based on the lease liability, adjusted for any lease incentives received and any initial direct costs paid to the lessor prior to the lease commencement date. The Company may enter into

leases with an initial term of 12 months or less (“Short-Term Leases”). For any Short-Term Leases, the Company records the rent expense on a straight-line basis and does not record the leases on the condensed balance sheet. The Company had no Short-Term Leases as of December 31, 2020 and 2019.

After lease commencement, the Company measures its leases as follows: (i) the lease liability based on the present value of the remaining lease payments using the discount rate determined at lease commencement and (ii) the right-of-use lease asset based on the remeasured lease liability, adjusted for any unamortized lease incentives received, any unamortized initial direct costs and the cumulative difference between rent expense and amounts paid under the lease agreement. Any lease incentives received and any initial direct costs are amortized on a straight-line basis over the expected lease term. Rent expense is recorded on a straight-line basis over the expected lease term.

Long-Lived Assets

The Company regularly reviews the carrying value and estimated lives of all of its long-lived assets, including property and equipment and right-of-use assets to determine whether indicators of impairment may exist which warrant adjustments to carrying values or estimated useful lives. The determinants used for this evaluation include management’s estimate of the asset’s ability to generate net positive cash flow in future periods as well as the strategic significance of the assets to the Company’s business objectives. Should an impairment exist, the impairment loss would be measured based on the extent that the estimated fair value is less than its carrying value. The Company did not recognize any impairment losses in the years ended December 31, 2020 and 2019.

Preclinical and Clinical Trial Accruals

The Company accrues and expenses amounts incurred in connection with preclinical studies and clinical trial activities performed by third parties based upon estimates of the proportion of work completed over the life of the individual trial and subject enrollment rates in accordance with agreements with clinical research organizations, contract manufacturing organizations and clinical trial sites. The Company determines the estimates by reviewing contracts, vendor agreements and purchase orders, and through discussions with internal clinical personnel and external service providers as to the progress or stage of completion of trials or services and the agreed-upon fee to be paid for such services. However, actual costs and timing of clinical trials are highly uncertain, subject to risks and may change depending upon a number of factors, including the Company’s clinical development plan.

Management makes estimates of the Company’s accrued expenses as of each balance sheet date in the Company’s condensed financial statements based on facts and circumstances known to the Company at that time. If the actual timing of the performance of services or the level of effort varies from the estimate, the Company will adjust the accrual accordingly. Nonrefundable advance payments for goods and services, including fees for process development or manufacturing and distribution of clinical supplies that will be used in future research and development activities, are deferred and recognized as expense in the period that the related goods are consumed or services are performed.

Research and Development Expense

Research and development costs are expensed as incurred. Costs incurred in obtaining technology licenses are charged to research and development expense if the technology has no alternative future use.

Stock-Based Compensation

The Company measures and recognizes compensation expense for all stock-based compensation based on the estimated fair value at the date of grant. Currently, the Company’s stock-based awards consist only of stock options; however, future grants under the Company’s equity compensation plan may also consist of shares of restricted stock, restricted stock units, stock appreciation rights, performance awards and performance units. The Company also maintains an employee stock purchase program ("ESPP") under which it may issue shares. The Company estimates the fair value of stock options and shares that will be issued under the ESPP using the Black-Scholes option-pricing model, which requires the use of estimates. The Company recognizes stock-based compensation cost for ratably vesting stock options and for shares that it will issue under the ESPP on a straight-line basis over the requisite service period of the award and records forfeitures in the period in which they occur.

The Black-Scholes option-pricing model requires the input of subjective assumptions, including the risk-free interest rate, the expected dividend yield of the Company’s common stock, the expected volatility of the price of the Company’s common stock, and the expected term of the option. These estimates involve inherent uncertainties and the application of

management's judgment. If factors change and different assumptions are used, the Company's stock-based compensation expense could be materially different in the future.

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 condensed 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 income 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 (1) 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 (2) 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% likely to be realized upon ultimate settlement with the related tax authority. The Company recognizes interest and penalties related to unrecognized tax benefits, if any, within income tax expense, and any accrued interest and penalties are included within the related tax liability line.

Grant Revenue

Grant revenue is derived from government grants that support the Company's efforts on specific research projects. The Company has determined that the government agencies providing grants to the Company are not customers. The Company recognizes grant revenue when there is reasonable assurance of compliance with the conditions of the grant and reasonable assurance that the grant revenue will be received.

Revenue Under Collaborative Agreement

The Company generates revenues from payments received under a collaborative agreement. Under such collaboration agreements, the Company recognizes revenue when it transfers promised goods or services to partners in an amount that reflects the consideration to which the Company expects to be entitled in exchange for those goods or services. To determine revenue recognition for contracts with partners, the Company performs the following five steps: (i) identifies the promised goods or services in the contract; (ii) identifies the performance obligations in the contract, including whether they are distinct in the context of the contract; (iii) determines the transaction price, including the constraint on variable consideration; (iv) allocates the transaction price to the performance obligations in the contract; and (v) recognizes revenue when (or as) the Company satisfies the performance obligations.

For revenue from such collaborative agreements, the Company generally collects an upfront license payment from the collaboration partner and is also entitled to receive event-based payments subject to the collaboration partner's achievement of specified development, regulatory and sales-based milestones. In addition, the Company is generally entitled to royalties if products under the collaboration are commercialized. Although such agreements are in form structured as collaborative agreements, for accounting purposes they represent contracts with partners that are not subject to accounting literature on collaborative arrangements. If the Company grants to collaboration partners a license to the Company's intellectual property, the Company does not develop assets jointly with the collaboration partner and does not share in significant risks of their development or commercialization activities.

Transaction price for a contract represents the amount to which the Company is entitled in exchange for providing goods and services to the partner. Transaction price does not include amounts subject to uncertainties unless it is probable that there will be no significant reversal of revenue when the uncertainty is resolved. Apart from the upfront license payment, all other fees the Company may earn under such collaborative agreements are subject to significant uncertainties of product development. Achievement of many of the event-based development and regulatory milestones may not be probable until such

milestones are actually achieved. This generally relates to milestones such as obtaining marketing authorization approvals and successful completion of clinical trials. With respect to other development milestones, e.g. dosing of a first patient in a clinical trial, achievement could be considered probable prior to its actual occurrence, based on the progress towards commencement of the trial. The Company does not include any amounts subject to uncertainties into the transaction price until it is probable that the amount will not result in a significant reversal of revenue in the future. At the end of each reporting period, the Company re-evaluates the probability of achievement of such milestones and any related constraint, and if necessary, adjusts the estimate of the overall transaction price.

Because such agreements generally only have one type of performance obligation, a license, which is generally all transferred at the same time as agreement inception, allocation of the transaction price among multiple performance obligations is not required.

Upfront amounts allocated to licenses are recognized as revenue when the licenses are transferred to the collaboration partners. Development milestones and other fees are recognized in revenue when their occurrence becomes probable.

Net Loss Per Share

Basic net loss per share is calculated by dividing the net loss by the weighted-average number of common shares outstanding during the period. Diluted net loss per share is computed by dividing the net loss by the weighted-average number of common shares and common share equivalents outstanding for the period. Common stock equivalents are only included when their effect is dilutive. The Company's potentially dilutive securities, which include outstanding stock options under the Company's stock option plan, warrants issued from time to time and shares of common stock to be potentially issued under the 2018 Employee Stock Purchase Plan (the "ESPP"), have been excluded from the computation of diluted net loss per share as they would be anti-dilutive. For all periods presented, there is no difference in the number of shares used to compute basic and diluted shares outstanding due to the Company's net loss position.

The following table sets forth the outstanding, potentially dilutive securities that have been excluded in the calculation of diluted net loss per share because their inclusion would be anti-dilutive:

	As of December 31,	
	2020	2019
Common stock options	3,598,160	2,577,718
Warrants to purchase common stock	2,349,595	149,595
Employee stock purchase plan	634,654	—
Total	6,582,409	2,727,313

Recent Accounting Pronouncements

In December 2019, the FASB issued ASU 2019-12, *Income Taxes (Topic 740): Simplifying the Accounting for Income Taxes*, which among other things, eliminates certain exceptions in the current rules regarding the approach for intraperiod tax allocations and the methodology for calculating income taxes in an interim period, and clarifies the accounting for transactions that result in a step-up in the tax basis of goodwill. The standard becomes effective for the Company in the first quarter of 2021. Adoption of this new standard will not have a material impact on the Company's financial statements and related disclosures.

In August 2018, the FASB issued ASU 2018-13, *Fair Value Measurement - Disclosure Framework (Topic 820): Changes to the Disclosure Requirements for Fair Value Measurement*. Among the changes, entities are no longer required to disclose the amount of and reasons for transfers between Levels 1 and 2 of the fair value hierarchy, but will be required to disclose the range and weighted average of significant unobservable inputs used to develop Level 3 fair value measurements. Effective January 1, 2020, the Company adopted this ASU, which did not have a material impact on its financial statements and related disclosures.

3. Fair Value Measurement

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 at the measurement date. 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 a liability.

The Company classifies fair value measurements in one of the following three categories for disclosure purposes:

Level 1: Quoted prices in active markets for identical assets or liabilities.

Level 2: Inputs other than Level 1 prices for similar assets or liabilities that are directly or indirectly observable in the marketplace.

Level 3: Unobservable inputs that are supported by little or no market activity and values determined using pricing models, discounted cash flow methodologies, or similar techniques, as well as instruments for which the determination of fair value requires significant judgment or estimation.

The Company's cash equivalents are classified using Level 1 inputs within the fair value hierarchy because they are valued using quoted market prices, broker or dealer quotations, or alternative pricing sources with reasonable levels of price transparency. 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.

The fair value of the Company's financial commitment to SFJ in conjunction with the SFJ Agreement is presented as a development derivative liability based on Level 3 inputs.

The following table summarizes the Company's assets and liabilities that require fair value measurements on a recurring basis and their respective input levels based on the fair value hierarchy (in thousands):

		Fair Value Measurements at Reporting Date		
	Total	Level 1	Level 2	Level 3
As of December 31, 2020:				
Assets				
Cash equivalents	$ 27,872	$ 27,872	$ —	$ —
Liabilities				
Development derivative liability (Note 7)	$ 51,719	$ —	$ —	$ 51,719
As of December 31, 2019:				
Assets				
Cash equivalents	$ 73,761	$ 73,761	$ —	$ —

4. Property and Equipment

The following table presents the composition of property and equipment, net as of December 31, 2020 and 2019 (in thousands):

	As of December 31,	
	2020	2019
Lab equipment	$ 8,994	$ 2,112
Computer hardware, software and telephone	140	279
Furniture and fixtures	107	107
Leasehold improvements	67	67
Construction in progress	1,042	1,318
	10,350	3,883
Less accumulated depreciation	(2,126)	(1,959)
Property and equipment, net	$ 8,224	$ 1,924

Depreciation expense was $0.5 million and $0.2 million for the years ended December 31, 2020 and 2019, respectively.

5. Accrued Expenses and Other Current Liabilities

The following table presents the composition of accrued expenses and other current liabilities as of December 31, 2020 and 2019 (in thousands):

	As of December 31,	
	2020	2019
Accrued clinical and related costs	$ 2,753	$ 819
Accrued compensation and related costs	2,260	1,746
Accrued interest	69	84
Operating lease liability, short-term	459	265
Accrued other	390	266
Accrued expenses and other current liabilities	$ 5,931	$ 3,180

6. Debt

Term Loans

October 2017 Loan Agreement with Silicon Valley Bank

In October 2017, the Company entered into a Loan and Security Agreement (“SVB Loan”) with Silicon Valley Bank (“SVB”), pursuant to which the Company could borrow up to $7.5 million, issuable in three separate tranches (“Growth Capital Advances”) of $3.5 million (“Tranche A”), $2.0 million (“Tranche B”) and $2.0 million (“Tranche C”). In November 2017, the Company drew $3.5 million from Tranche A. Each of the Growth Capital Advances were available upon the achievement of certain clinical and regulatory milestones. Under the terms of the SVB Loan, as amended, the Company was required to make interest-only payments through December 31, 2018, followed by an amortization period of 24 months of equal monthly payments of principal plus interest amounts until paid in full. The maturity date of the SVB Loan was December 31, 2020.

In connection with the SVB Loan, the Company issued to SVB a warrant to purchase 49,713 shares of Series C-1 at an exercise price of $9.659 per share, which became exercisable for common stock following the Company's initial public offering in October 2018 (the "IPO"). The warrant is immediately exercisable and expires on October 18, 2027.

The Company was required to make a final payment equal to 7% of the original aggregate principal amount of the Growth Capital Advances at maturity. The Company repaid the outstanding principal balance and accrued portion of the final payment under the SVB Loan in full using the first tranche from the new term loan entered into in March 2019 ("the 2019 Loan").

March 2019 Loan Agreement with Silicon Valley Bank and WestRiver Innovation Lending Fund VIII, L.P.

In March 2019, the Company entered into the 2019 Loan with SVB and WestRiver Innovation Lending Fund VIII, L.P. (“WestRiver”), pursuant to which the Company could borrow up to $15.0 million, issuable in three separate tranches (“Advances”), of $7.5 million (“Tranche 1”), which was issued upon execution of the 2019 Loan, $2.5 million, which was issued in May 2019 (“Tranche 2”) and $5.0 million, which was issued in October 2019 (“Tranche 3”), which the Company was required to draw upon the achievement of certain regulatory milestones (the “Tranche 3 Milestones”).

The maturity date of the 2019 Loan is March 1, 2023. Under the terms of the 2019 Loan, the Company made interest-only payments through June 30, 2020 with respect to Tranche 1, Tranche 2 and Tranche 3 at a rate equal to the greater of the Prime Rate plus 1.00%, as defined in the 2019 Loan, or 6.5%, followed by an amortization period of 33 months of equal monthly payments of principal plus interest until paid in full. In addition to and not in substitution for the Company’s regular monthly payments of principal plus accrued interest, the Company is required to make a final payment equal to 6% of the aggregate principal amount of the advances (“Final Payment”) on the maturity date.

Upon execution of the 2019 Loan and the draw of Tranche 1, the Company issued to SVB and WestRiver warrants to purchase an aggregate of 37,606 shares of common stock with an exercise price of $4.73 per share. In May 2019, upon the draw of Tranche 2, the Company issued to SVB and WestRiver warrants to purchase an aggregate of 12,130 shares of common stock with an exercise price of $10.86 per share. In October 2019, upon the draw of Tranche 3, the Company issued to SVB and WestRiver warrants to purchase an aggregate of 24,262 shares of common stock with an exercise price of $3.88 per share. All warrants are immediately exercisable and expire ten years from the date of issuance.

Upon execution of the 2019 Loan, the Company drew $7.5 million from Tranche 1 and repaid the outstanding principal balance and the accrued portion of the Final Payment of the SVB Loan.

The Company's obligations under the 2019 Loan are secured by a first-priority security interest in substantially all of the Company's current and future assets. The Company is also obligated to comply with various other customary covenants, including restrictions on the Company's ability to encumber its intellectual property assets. The Company was in compliance with all covenants under the 2019 Loan as of December 31, 2020.

The Company recorded a debt discount of $0.4 million for the estimated fair value of warrants and debt issuance costs upon the borrowing of Tranches 1, 2 and 3. The balance of the Final Payment liability was $0.6 million as of December 31, 2020 and is included in other long-term liabilities on the balance sheet. The debt discount and the Final Payment liability are being amortized to interest expense over the term of the 2019 Loan using the effective-interest method. Interest expense, including amortization of the debt discount related to the term debt and the Final Payment liability, totaled $1.4 million and $1.1 million for the years ended December 31, 2020 and 2019, respectively.

The following table sets forth by year the Company's required future principal payments as of December 31, 2020 (in thousands):

Years Ending December 31,		
2021	$	5,455
2022		5,455
2023		1,363
Thereafter		—
Total principal payments		12,273
Less unamortized loan fees		(145)
Total term loan borrowings	$	12,128

7. Development Derivative Liability

In January 2020, the Company entered into the SFJ Agreement, pursuant to which SFJ has agreed to provide up to $120.0 million in funding and project management services in connection with the REVERSE-IT trial, a global Phase 3 clinical trial of bentracimab. During the term of the SFJ Agreement, the Company will have primary responsibility for clinical development and regulatory activities for bentracimab in the United States and the European Union, while SFJ will have primary responsibility for clinical development and regulatory activities for bentracimab in China and Japan and will provide clinical trials operational support in the European Union.

From the inception of the SFJ Agreement through December 31, 2020, SFJ has provided funding and paid for amounts on the Company's behalf in the aggregate amount of $47.1 million under the SFJ Agreement. In addition, the Company expects that SFJ will fund or reimburse an additional $42.9 million of clinical trial costs and other expenses. SFJ will also provide up to an additional $30.0 million upon the achievement of specified milestones with respect to the Company's clinical development of bentracimab.

If the United States Food and Drug Administration ("FDA") approves a Biologics License Application for bentracimab, the Company has agreed to pay to SFJ an initial payment of $5.0 million and an additional $325.0 million in the aggregate in seven additional annual payments (the "U.S. Approval Payments"). If the European Medicines Agency ("EMA") or the national regulatory authorities in certain European countries provide marketing approval of bentracimab, the Company will pay SFJ an initial payment of $5.0 million and an additional $205.0 million in the aggregate in seven additional annual payments (the "EU Approval Payments"). The majority of the U.S. Approval Payments and the EU Approval Payments will be made from the third anniversary to the seventh anniversary of marketing approval in the applicable jurisdiction. If either the Pharmaceuticals and Medical Devices Agency (the "PMDA") of Japan or the National Medical Products Administration (the "NMPA") of China provides marketing approval of bentracimab, the Company will pay SFJ an initial payment of $1.0 million and then an additional $59.0 million in the aggregate in eight additional annual payments (the "Japan/China Approval Payments"), with the majority of the payments to be made from the fifth anniversary to the eighth anniversary of marketing approval. The Japan/China Approval Payments will only be paid once regardless of receipt of marketing approval in both Japan and China. The U.S. Approval Payments, EU Approval Payments and Japan/China Approval Payments will be proportionately adjusted in the event that the actual funding from SFJ is lower or greater than $120.0 million. The Company will not be obligated to make the U.S. Approval Payments if it does not receive marketing approval for bentracimab from the FDA, the EU

Approval Payments if it does not receive marketing approval for bentracimab from the EMA or the national regulatory authority in certain European countries or the Japan/China Approval Payments if it does not receive marketing approval for bentracimab from either the PMDA or the NMPA.

Upon execution of the SFJ Agreement, the Company issued to SFJ 2,200,000 common stock warrants at an exercise price of $6.50 per share and a contractual term of ten years. The warrants were issued in two tranches: Tranche A and Tranche B. Tranche A represents 1,100,000 warrants that are immediately exercisable by SFJ, provided that SFJ may not sell such exercised shares until one year from the original warrant issuance date. Tranche B represents 1,100,000 warrants that are exercisable at the earlier of (i) the achievement of certain development milestones or (ii) the consummation of an Acquisition, as defined in the SFJ Agreement. The warrants are equity-classified and were valued at $7.9 million at issuance using a probability adjusted Black-Scholes valuation technique.

The Company accounts for the SFJ Agreement as a derivative instrument that increases and decreases as consideration is received and repayments are made, respectively. The derivative is further adjusted at each reporting period to its estimated fair value. At December 31, 2020, the derivative is presented as a liability in the Company's balance sheet. Any changes in fair value are recorded within the Company's statement of operations. The liability was initially recorded at a value of $2.1 million, which incorporates the $10.0 million upfront payment from SFJ and the issuance of the Company's common stock warrants to SFJ. During the year ended December 31, 2020, SFJ provided additional funding and paid for amounts on the Company's behalf in the aggregate amount of $37.1 million, and the development derivative liability was subsequently remeasured at December 31, 2020, as a Level 3 derivative. The change of fair value resulted in a $12.5 million loss from remeasurement of development derivative liability on the statement of operations for the year ended December 31, 2020.

The derivative is valued using a scenario-based discounted cash flow method, whereby each scenario makes assumptions about the probability and timing of cash flows, and such cash flows are present valued using a risk-adjusted discount rate. The valuation method incorporates certain unobservable Level 3 key inputs including (i) the probability and timing of funding, (ii) the probability and timing of achieving regulatory approvals, (iii) the Company's cost of borrowing (16.00% plus the risk free borrowing rate) and (iv) SFJ's cost of borrowing (2.50% plus the risk free borrowing rate).

The following table presents activity for the development derivative liability during the year ended December 31, 2020 (in thousands):

	Development Derivative Liability
Balance at December 31, 2019	$ —
Initial payment, net of common stock warrants	2,075
Funding during the period	37,137
Change in fair value	12,507
Balance at December 31, 2020	$ 51,719

8. Commitments and Contingencies

Legal Proceedings

The Company is not currently a party to any litigation, nor is management aware of any pending or threatened litigation against the Company, that it believes would materially affect the Company’s business, operating results, financial condition or cash flows.

9. Leases

The Company leases office and research and development facilities and equipment under various non-cancellable operating lease agreements.

In January 2010, the Company entered into a lease for office and laboratory space in Malvern, Pennsylvania (the “Malvern Lease”). The Malvern Lease commenced in March 2010 and was amended to extend its term to July 31, 2018 and again to September 30, 2023, with an option to extend the lease for an additional three years. This lease contains escalating rent payments. In December 2018, the Company entered into a lease for office space in San Diego, California, which expires in October 2022. In June 2020, the Company entered into a lease for additional office space in Malvern, Pennsylvania, which expires in September 2023. As of December 31, 2020, the weighted-average remaining lease term for the Company’s leases

was 4.6 years, and the weighted-average discount rate used to determine the right-of-use assets and corresponding operating lease liabilities was 5.8%.

Maturities of operating lease liabilities as of December 31, 2020 are as follows (in thousands):

Year Ending December 31,		
2021	$	564
2022		555
2023		419
2024		279
2025		283
Thereafter		215
Total future minimum lease payments		2,315
Less: Present value adjustment		(308)
Operating lease liabilities	$	2,007

The Company recognizes rent expense for the operating leases on a straight-line basis. Rent expense was $0.6 million and $0.5 million for the years ended December 31, 2020 and 2019, respectively.

10. Stockholders' Equity

April 2019 Offering

In April 2019, the Company completed an underwritten public offering of its common stock, which resulted in the issuance and sale of an aggregate of 4,124,475 shares of common stock at a public offering price of $12.00 per share, generating net proceeds of $46.3 million after deducting underwriting discounts and commissions and other offering costs.

Shelf Registration Statement

In December 2019, the Company filed the 2019 Shelf Registration Statement on Form S-3, which became effective in January 2020. The 2019 Shelf Registration Statement permits: (i) the offering, issuance and sale by the Company of up to a maximum aggregate offering price of $200.0 million of common stock, preferred stock, debt securities and warrants in one or more offerings and in any combination; and (ii) the offering, issuance and sale by the Company of up to a maximum aggregate offering price of $60.0 million of the Company's common stock that may be issued and sold in "at-the-market" sales under the ATM Program. During the year ended December 31, 2020, the Company sold 561,848 shares of common stock pursuant to the ATM Program for gross proceeds of $2.9 million.

11. Stock-Based Compensation

Stock Plans

In October 2018, the Company's board of directors and stockholders adopted and approved the 2018 Equity Incentive Plan (the "2018 Plan"), which is a successor to and continuation of the Amended and Restated 2002 Stock Plan (the "2002 Plan"). No further grants will be made under the 2002 Plan.

Initially, the maximum number of shares of the Company's common stock that may be issued under the 2018 Plan was 3,231,626 shares. As of December 31, 2020, the Company had 1,012,857 shares available for grant under the 2018 Plan. The number of shares of common stock reserved for issuance under the 2018 Plan automatically increases on January 1 of each calendar year, starting on January 1, 2019 through January 1, 2028, in an amount equal to 3% of the total number of shares of the Company's capital stock outstanding on the last day of the calendar month before the date of each automatic increase, or a lesser number of shares determined by the Company's board of directors. Subject to this provision, the Company added 883,257 shares available for grant to the 2018 Plan effective January 1, 2021.

The following table summarizes stock option activity for the 2002 Plan and 2018 Plan for the year ended December 31, 2020:

	Total Options	Weighted-Average Exercise Price Per Share	Weighted-Average Remaining Contractual Term (in years)	Aggregate Intrinsic Value
Outstanding at Ended December 31, 2018	1,545,403	$ 2.48	7.6	$ 1,593,487
Granted	1,260,540	$ 4.19		
Exercised	(143,654)	$ 1.71		
Cancelled or expired	(84,571)	$ 4.65		
Outstanding at December 31, 2019	2,577,718	$ 3.29	7.9	$ 7,914,459
Granted	1,227,159	$ 5.09		
Exercised	(51,572)	$ 1.85		
Cancelled or expired	(155,145)	$ 4.89		
Outstanding at December 31, 2020	3,598,160	$ 3.85	7.5	$ 1,737,432
Vested and expected to vest at December 31, 2020	3,598,160	$ 3.85	7.5	$ 1,737,432
Vested and exercisable at December 31, 2020	1,864,186	$ 3.26	6.5	$ 1,559,887

The weighted-average grant date fair value per share of options granted was $3.20 and $2.62 for the years ended December 31, 2020 and 2019, respectively. The aggregate intrinsic value of options exercised was $0.1 million and $1.0 million for the years ended December 31, 2020 and 2019, respectively.

As of December 31, 2020, the total unrecognized compensation expense related to unvested employee and non-employee stock option awards was $4.6 million, which is expected to be recognized in expense over a weighted-average period of 2.4 years.

In October 2018, the Company’s board of directors and stockholders approved the ESPP. The purpose of the ESPP is to secure the services of new employees, to retain the services of existing employees and to provide incentives for such individuals to exert maximum efforts toward the Company’s success and that of the Company’s affiliates. The ESPP is intended to qualify as an “employee stock purchase plan” within the meaning of Section 423 of the Code for United States employees.

Initially, the ESPP authorized the issuance of 196,000 shares of the Company’s common stock under purchase rights granted to the Company’s employees or to employees of any of the Company’s designated affiliates. As of December 31, 2020, the Company had 666,584 shares available for issuance under the ESPP. The number of shares of common stock reserved for issuance automatically increases on January 1 of each calendar year, beginning on January 1, 2019 through January 1, 2028, by the lesser of (1) 1% of the total number of shares of the Company’s common stock outstanding on the last day of the calendar month before the date of the automatic increase, and (2) 490,000 shares; provided that before the date of any such increase, the Company’s board of directors may determine that such increase will be less than the amount set forth in clauses (1) and (2). Subject to this provision, the Company added 294,419 shares available for issuance to the ESPP effective January 1, 2021.

In March 2020, the Company began allowing eligible employees to participate in the ESPP. Under the ESPP, eligible employees are granted rights to purchase shares of the Company's common stock, which are funded through payroll deductions that cannot exceed 15% of each employee's compensation. The ESPP generally provides for a 24-month offering period, which includes four six-month purchase periods. At the end of each purchase period, eligible employees are permitted to purchase shares of the Company's common stock at 85% of the lower of fair market value at the beginning of the offering period or fair market value at the end of the purchase period. The ESPP is considered a compensatory plan, and the Company recorded stock-based compensation expense of $0.1 million for the year ended December 31, 2020. As of December 31, 2020, 62,063 shares of common stock had been purchased under the ESPP.

As of December 31, 2020, the total unrecognized compensation expense related to the ESPP was $0.6 million, which is expected to be recognized over a weighted-average period of approximately 1.2 years.

Determining Fair Value of Stock Options

The fair value of each grant of stock options was determined by the Company using the methods and assumptions discussed below. Certain of these inputs are subjective and generally require judgment to determine.

Expected Term—The expected term of stock options represents the weighted-average period the stock options are expected to be outstanding. The Company uses the simplified method for estimating the expected term. The simplified method calculates the expected term as the average time-to-vesting and the contractual life of the options.

Expected Volatility—Due to the Company's limited operating history and lack of company-specific historical or implied volatility, the expected volatility assumption was determined by examining the historical volatilities of a group of industry peers whose share prices are publicly available.

Risk-Free Interest Rate—The risk-free rate assumption is based on the United States Treasury instruments, the terms of which were consistent with the expected term of the Company's stock options.

Expected Dividend—The Company has not paid and does not intend to pay dividends.

The fair value of each option was estimated on the date of grant using the weighted-average assumptions in the table below:

	Year Ended December 31,	
	2020	2019
Risk-free interest rate	1.37 %	2.36 %
Expected term (in years)	6.0	5.9
Expected volatility	71 %	69 %
Expected dividend yield	—	—
Fair value of common stock	$ 5.09	$ 4.19

Stock-based compensation expense has been reported in the Company's statements of operations for the years ended December 31, 2020 and 2019 as follows (in thousands):

	Year Ended December 31,	
	2020	2019
General and administrative	$ 1,594	$ 1,135
Research and development	643	286
Total stock-based compensation	$ 2,237	$ 1,421

12. License and Other Agreements

MedImmune Limited License Agreement

In November 2017, the Company entered into a license agreement ("MedImmune License") with MedImmune Limited ("MedImmune"). MedImmune is a wholly-owned subsidiary of AstraZeneca plc ("AstraZeneca"). Pursuant to the terms of the MedImmune License, MedImmune granted the Company exclusive global rights for the purpose of developing and commercializing products under the MedImmune License ("MedImmune licensed product"). The Company made contingent milestone payments of $2.0 million and $1.0 million during the years ended December 31, 2020 and 2019, respectively, and is obligated to make remaining payments totaling up to an aggregate of $15.0 million upon the achievement of clinical development and regulatory milestones. In addition, the Company will pay MedImmune tiered royalties ranging from mid-single-digit to low-teen percentages of net sales of any MedImmune licensed products and additional payments of up to $50.0 million in aggregate commercial milestones. The Company incurred no royalty costs in the years ended December 31, 2020 and 2019.

The Company also must pay quarterly fees relating to technical services provided by MedImmune. The MedImmune License requires the Company to cooperate with MedImmune on commercial messaging of bentracimab and provides MedImmune with the return of rights to bentracimab if certain commercial diligence requirements are not achieved by the Company. In addition, the MedImmune License offers an option for third-party product storage costs. The Company incurred no third-party product storage costs during the years ended December 31, 2020 and 2019. AstraZeneca is a stockholder of the Company.

Duke License Agreement

In October 2006, the Company entered into a license agreement with Duke University (“Duke”) (as amended, the “Duke License”). Pursuant to the Duke License, Duke granted to the Company an exclusive, worldwide license under certain patent rights and a non-exclusive license to know-how owned or controlled by Duke to develop and commercialize any products or processes covered under the Duke License (the “Duke licensed products”). The Duke License was amended in February 2016 to allow Duke to use the Company’s technology in the area of small-molecule oncologics. The Duke License is a worldwide, sublicensable agreement and remains in full effect for the life of the last-to-expire patents included in the patent rights, which is estimated to be 2030. The Company is required to apply for, prosecute and maintain all United States and foreign patent rights under the Duke License.

The Company is obligated to pay up to $2.2 million upon the achievement of clinical development and regulatory milestones and up to $0.4 million upon the achievement of commercial milestones. The Duke License may be terminated by Duke if the Company fails to meet certain clinical development and regulatory milestones within specified timeframes. As of December 31, 2020, the Company was in compliance with its development obligations.

The Company is required to use commercially reasonable efforts to develop one or more products or processes and introduce them into commercial markets. Duke will receive low single-digit royalty percentages on net sales of Duke licensed products by the Company or its sublicensee, with minimum aggregate royalties of $0.2 million payable following the Company’s achievement of certain commercial milestones. No sales of Duke licensed products or services have occurred since the effective date through December 31, 2020.

Certain alliance fee payments up to the greater of $0.3 million or a low double-digit percentage of the fees the Company receives from a third party in consideration of forming a strategic alliance, may be required depending upon how the patent rights are commercialized. The Company must pay Duke the first $1.0 million of nonroyalty payments it receives from a sublicensee, and thereafter a specified percentage of any additional nonroyalty payments it receives, subject to certain conditions. If Duke receives revenue as a result of a license or sublicense to a third party in the field of small-molecule oncologics, it will pay the Company a specified percentage of the amount of such revenue in excess of $1.0 million. The Company incurred no costs under the Duke License for the year ended December, 31, 2020, and $0.3 million for the year ended December 31, 2019.

Wacker License Agreement

In April 2019, the Company entered into a license agreement (“Wacker License Agreement”), with Wacker Biotech GmbH (“Wacker”), pursuant to which Wacker granted the Company an exclusive license under certain of Wacker’s intellectual property rights to use Wacker’s proprietary *E. coli* strain for the manufacture of bentracimab worldwide outside of specified Asian countries, and to commercialize bentracimab, if approved, manufactured by the Company or on the Company’s behalf using Wacker’s proprietary *E. coli* strain throughout the world. The Company has the right to grant sublicenses under the license, subject to certain conditions as specified in the Wacker License Agreement. Under the terms of the agreement, the Company is required to pay a fixed, nominal per-unit royalty, which is subject to adjustment, and an annual license fee in a fixed Euro amount in the low to mid six digits. The agreement will be in force for an indefinite period of time, and upon the expiration of the Company’s royalty obligations, the license will be considered fully paid and will convert to a non-exclusive license. Either party may terminate the Wacker License Agreement for breach if such breach is not cured within a specified number of days. The Company incurred $0.3 million and $0.2 million in costs under the Wacker License Agreement for the years ended December 31, 2020 and 2019, respectively.

Viamet Asset Purchase Agreement

In January 2020, the Company entered into a purchase agreement ("PB6440 Agreement") with Viamet Pharmaceuticals Holdings, LLC and its wholly-owned subsidiary, Selenity Therapeutics (Bermuda), Ltd. (the "Sellers"), pursuant to which the Company acquired all of the assets and intellectual property rights related to the Sellers’ proprietary CYP11B2 inhibitor compound, formerly known as SE-6440 or VT-6440, and certain other CYP11B2 inhibitor compounds that are covered by the patent rights acquired by the Company under the PB6440 Agreement (together, "Compounds"). Under the terms of the PB6440 Agreement, the Company paid the Sellers an upfront fee of $0.1 million upon the closing of the transaction, and are required to pay the Sellers up to $5.1 million upon the achievement of certain development and intellectual property milestones with respect to certain product candidates that contain a Compound, up to $142.5 million upon the achievement of certain commercial milestones with respect to any approved product that contains a Compound and low- to mid-single digit royalty percentages on the net sales of approved products that contain a Compound, subject to customary

reductions and offsets in specified circumstances. The Company incurred $0.1 million in costs under the PB6440 Agreement for the year ended December 31, 2020.

13. Revenue

Grant revenue

In February 2018, the Company received Small Business Innovation Research ("SBIR") grants from the National Institutes of Health in an aggregate amount of $2.8 million to support the clinical development of pemziviptadil for the treatment of pulmonary arterial hypertension for the period from February 17, 2018 to July 31, 2020. In connection with the SBIR grants, the United States government will receive a non-exclusive, royalty-free license to use any technology the Company develops under such grants. As of March 31, 2020, the Company had received all $2.8 million in funding available under the SBIR grant. The Company recognized $0.3 million and $1.8 million under the SBIR grants in the years ended December 31, 2020 and 2019, respectively.

Revenue Under Collaborative Agreement

In April 2019, the Company entered into an agreement with ImmunoForge Co., Ltd. ("ImmunoForge") for the exclusive, worldwide license of PB1023, a long-acting, recombinant glucagon-like peptide-1 analogue, for the treatment of certain diseases, including conditions related to sarcopenia.

The Company received an upfront payment of $0.2 million upon execution of the contract, $0.1 million for certain scientific consulting services and was entitled to receive $0.3 million within one year of the effective date of the agreement. The Company is eligible to receive milestone-based payments and mid-single digit royalty payments on net sales of licensed products, a percentage of which Duke is entitled to receive pursuant to the Duke License. The Company recognized zero and $0.6 million in revenue related to the ImmunoForge agreement for the years ended December 31, 2020 and 2019, respectively.

14. Income Taxes

The Company's loss before income taxes was $98.6 million and $39.2 million for the years ended December 31, 2020 and 2019, respectively and was generated entirely in the United States. The Company did not record current or deferred income tax expense or benefit during the years ended December 31, 2020 and 2019.

A reconciliation of income tax expense (benefit) to the amount computed by applying the statutory federal income tax rate to the loss from operations is summarized for the years ended December 31, 2020 and 2019, respectively, as follows (in thousands):

	Year Ended December 31,	
	2020	2019
Income tax benefit at statutory rate	$ (20,699)	$ (8,242)
State income tax, net of federal benefit	(6,823)	(3,783)
Permanent items	8	16
Stock-based compensation	215	56
Orphan drug credit	(2,544)	(925)
Research and development credits	(863)	(763)
Uncertain tax positions	785	548
Change in state rate	74	(34)
Change in valuation allowance	28,090	13,179
Other	1,757	(52)
	$ —	$ —

Significant components of the Company's deferred tax assets as of December 31, 2020 and 2019 are shown below (in thousands):

	As of December 31,	
	2020	2019
Deferred tax assets:		
Net operating loss carryforwards	$ 51,398	$ 42,872
Research and development and orphan drug credits	8,662	6,212
Accrued expenses	936	519
Intangibles	43	60
Operating lease liabilities	562	545
Derivative liability	16,700	—
Other, net	628	322
Total deferred tax assets	78,929	50,530
Deferred tax liabilities:		
Operating lease right-of-use assets	(540)	(527)
Property and equipment, net	(324)	(28)
Total deferred tax liabilities	(864)	(555)
Net deferred tax assets before valuation allowance	78,065	49,975
Valuation allowance	(78,065)	(49,975)
Net deferred tax assets	$ —	$ —

As of December 31, 2020 and 2019, management assessed the realizability of net deferred tax assets and evaluated the need for a valuation allowance against the net deferred tax assets. This evaluation utilizes the framework contained in ASC 740, *Income Taxes*, whereby management considers all available positive and negative evidence as of the balance sheet date to determine whether all or some portion of the Company's net deferred tax assets will be realized. Under this guidance, a valuation allowance must be established for net deferred tax assets when it is more-likely-than-not (a probability level of more than 50%) that the asset will not be realized.

Management followed the guidance in ASC 740, which states that "a cumulative loss in recent years is a significant piece of negative evidence that is difficult to overcome" and concluded that the Company's net deferred tax assets were not realizable as of December 31, 2020 and 2019. Accordingly, a valuation allowance of $78.1 million and $50.0 million has been recorded to offset the net deferred tax assets. The change in valuation allowance for the years ended December 31, 2020 and 2019 was an increase of $28.1 million and an increase of $13.2 million, respectively.

At December 31, 2020, the Company had federal and state net operating loss ("NOL") carryforwards of $185.1 million, and $167.2 million, respectively. The federal NOLs generated prior to 2018 may be used to offset up to 100% of future taxable income and will begin to expire in 2022, unless previously utilized or limited by other provisions within the tax law. The federal NOL generated post-2017 of $93.6 million may be available to offset up to 80% of future taxable income and may be carried forward indefinitely unless limited by other provisions within the tax law. The state NOLs will begin to expire in 2029, unless previously utilized. The Pennsylvania NOLs of $125.7 million may be used to offset 40% of future taxable income per year.

At December 31, 2020, the Company has federal and state research and development tax credit carryforwards totaling $4.5 million and $0.4 million, respectively. The federal and state research and development tax credit carryforwards will begin to expire in 2028 and 2029, respectively, unless previously utilized. The California research tax credit carryovers do not expire.

At December 31, 2020, the Company also has federal orphan drug credit carryforwards of $6.7 million, which will begin to expire in 2036, unless previously utilized.

Through December 31, 2020, the Company has generated a combination of research and development credits and orphan drug credits. Certain of these credits were derived from tax credit studies to document the qualified activities and certain other credits were not derived from studies. For the credits that were calculated through a study, the IRS, on audit, may disagree

with the amount of credits calculated. When studies are ultimately performed for the other credits, they may result in an adjustment to those specific credits.

Under the Internal Revenue Code, the utilization of a corporation's net operating loss and tax credit carryforwards may be limited following a greater than 50% change in ownership over a three-year period. Any unused annual limitation may be carried forward to future years for the balance of the net operating loss and tax credit carryforward period. Under these rules, prior ownership changes may have created a limitation in the Company's ability to use certain tax carryforwards on a yearly basis. Additionally, certain state operating losses may also be similarly limited.

The Company applies the two-step approach to recognizing and measuring uncertain tax positions. The first step is to evaluate the tax position for recognition by determining if the weight of available evidence indicates it is more likely than not that the position will be sustained on audit, including resolution of related appeals or litigation processes, if any. The second step is to measure the tax benefit as the largest amount, which is more than 50% likely of being realized upon ultimate settlement. Income tax positions must meet a more likely than not recognition threshold at the effective date to be recognized upon the adoption of ASC 740 and in subsequent periods. This interpretation also provides guidance on measurement, derecognition, classification, interest and penalties, accounting in interim periods, disclosure and transition.

The Company files income tax returns in the United States federal jurisdiction and various state jurisdictions. Tax years 2017 and forward remain open for examination for federal tax purposes and tax years 2017 and forward remain open for examination for the Company's more significant state tax jurisdictions. To the extent utilized in future years' tax returns, net operating loss carryforwards at December 31, 2020 will remain subject to examination until the respective tax year is closed.

The following table summarizes the activity related to the Company's gross unrecognized tax benefits for the years ended December 31, 2020 and 2019 (in thousands):

	Year Ended December 31	
	2020	2019
Gross unrecognized tax benefits at the beginning of the year	$ 2,560	$ 1,809
Increases related to current year positions	871	645
Increases related to prior year positions	—	106
Decreases related to prior year positions	(86)	—
Expiration of unrecognized tax benefits	—	—
Gross unrecognized tax benefits at the end of the year	$ 3,345	$ 2,560

Due to the Company's valuation allowance, none of the unrecognized tax benefits, if recognized, would affect the Company's effective tax rate.

As of December 31, 2020, and 2019, the Company had unrecognized tax benefits of $3.3 million and $2.6 million, respectively. The Company recognizes interest and penalties related to uncertain tax positions in income tax expense. During the years ended December 31, 2020 and 2019, the Company did not accrue any interest and penalties on uncertain tax positions. The Company does not expect its unrecognized tax benefits to change significantly within the next 12 months.

On March 27, 2020, the Unites States enacted the Coronavirus Aid, Relief and Economic Security Act (the "CARES Act"). The CARES Act is an emergency economic stimulus package that includes spending and tax breaks to strengthen the United States economy and fund a nationwide effort to curtail the effect of COVID-19. While the CARES Act provides sweeping tax changes in response to the COVID-19 pandemic, some of the more significant provisions which are expected to impact the Company's financial statements include removal of certain limitations on utilization of net operating losses, increasing the loss carryback period for certain losses to five years, and increasing the ability to deduct interest expense, as well as amending certain provisions of the previously enacted Tax Cuts and Jobs Act. The Company doesn't believe that the CARES Act will have a material impact on its financial position, results of operations, or cash flows.

15. Employee Retirement Plan

The Company has an employee retirement plan pursuant to Section 401(k) of the Internal Revenue Code. All employees are eligible to participate, provided they meet the requirements of this plan. The Company is not required to make matching contributions under the plan; however, in 2019, the Company began making matching contributions. The Company voluntarily contributed $0.2 million and $0.1 million to the plan for the years ended December 31, 2020 and 2019, respectively.

16. Related Party Transactions

As described above in Note 12, the Company is party to the MedImmune License. AstraZeneca, the parent company of MedImmune, is a related party of the Company.

17. Subsequent Events

In March 2021, the Company entered into a supply agreement (the "BioVectra Agreement") with BioVectra Inc. ("BioVectra") for the manufacture and supply by BioVectra of bulk drug substance for bentracimab, for commercial distribution following regulatory approval, if obtained. Under the terms of the BioVectra Agreement, BioVectra has committed to maintaining capacity to manufacture an agreed number of batches of product each year, and the Company has committed to purchase a specified minimum number of batches of product per year (the "Minimum Annual Commitment"), although the Company is free to contract with third parties for the manufacture of bentracimab.

The Company will pay a supply price per batch of product to be determined after the manufacturing process for the product is validated in accordance with the BioVectra Agreement, plus the cost of certain consumables, raw materials, and third-party testing. The parties have agreed that the initial supply price of product will be within a specified percentage of the estimated supply price set forth in the BioVectra Agreement and will remain firm through the second anniversary of validation. Thereafter, on an annual basis following the second anniversary of validation, either party may propose adjustments to the supply price for increases or decreases based on a specified inflation rate, subject to a maximum inflation adjustment per year, and BioVectra may propose adjusting the supply price beyond that inflation rate if it can document extraordinary increases or decreases in costs, subject to a specified maximum percentage increase or decrease per year.

Pursuant to the Minimum Annual Commitments, the Company is obligated to purchase a minimum of (i) approximately $14.0 million of batches of product in years 2022 through 2023, (ii) approximately $37.0 million of batches of product in 2024, and (iii) approximately $48.0 million of batches of product in each of years 2025 through 2031. In the event the Company does not purchase the applicable Minimum Annual Commitment in a given year, the Company will be obligated to make a payment to BioVectra in an amount equal to the then-applicable supply price per batch multiplied by the difference between the Minimum Annual Commitment for such year and the number of batches of product the Company actually purchased in such year (the “Minimum Shortfall Payment”), except in the event that BioVectra was unable to deliver the number of batches ordered by the Company in such year. In the event of certain serious or extended failures by BioVectra to supply product in the quantities ordered by the Company in a given year, the Company’s Minimum Annual Commitment for such year (and potentially one or more subsequent years) will be subject to reduction, and the Company’s obligation to make a Minimum Shortfall Payment for such year (and potentially one or more subsequent years) will be waived. The Company will have the right to reduce the Minimum Annual Commitments for the year 2026 and subsequent years by up to a specified maximum percentage per year. Further, if the Company is only able to obtain regulatory approval for products incorporating bentracimab in only one of the U.S. or Europe, BioVectra and the Company have agreed to discuss in good faith an amendment to the Agreement to reflect decreased requirements for product and impacts to the supply price to reflect lower volume commitments.

The initial term of the BioVectra Agreement commences on the effective date of the BioVectra Agreement and continues until the tenth anniversary of validation. The term of the BioVectra Agreement may be extended for additional one-year periods upon mutual agreement of the parties. Either party may terminate the BioVectra Agreement in the event of an uncured material breach by the other party or upon the occurrence of certain events of insolvency of the other party. The Company may terminate the BioVectra Agreement (i) in the event of certain regulatory compliance failures by BioVectra or any person employed or retained by it to perform services under the BioVectra Agreement, or (ii) subject to payment of a termination fee to BioVectra (the amount of which decreases over the term of the BioVectra Agreement from an initial maximum in the mid-teens of millions of dollars to zero), in the event the Company decides that it will not, or is unable to, pursue regulatory approval or commercialization of products incorporating bentracimab or in the event of termination of the Company’s license to bentracimab from MedImmune Limited. The Company may also terminate the BioVectra Agreement without cause and without payment of a termination fee upon 24 months’ notice following the fifth anniversary of regulatory approval of a product incorporating bentracimab by either the FDA or EMA.

(a)(2) Financial Statement Schedules

All financial statement schedules have been omitted as they are not required, not applicable, or the required information is included in the financial statements or notes to the financial statements.

(a)(3) Exhibits

EXHIBIT INDEX

Exhibit Number	Exhibit Title	Incorporated by Reference			
		Form	File No.	Exhibit	Filing Date
3.1	Amended and Restated Certificate of Incorporation of PhaseBio Pharmaceuticals, Inc.	8-K	001-38697	3.1	October 22, 2018
3.2	Amended and Restated Bylaws of PhaseBio Pharmaceuticals, Inc.	S-1/A	333-227474	3.4	October 5, 2018
4.1	Form of Warrant to Purchase Shares of Series B Redeemable Convertible Preferred Stock, issued by PhaseBio Pharmaceuticals, Inc. on December 22, 2009.	S-1	333-227474	4.2	September 21, 2018
4.2	Warrant to Purchase Shares of Series C-1 Redeemable Convertible Preferred Stock, issued by PhaseBio Pharmaceuticals, Inc. to Silicon Valley Bank on October 18, 2017.	S-1	333-227474	4.3	September 21, 2018
4.3	Fourth Amended and Restated Investor Rights Agreement, by and among PhaseBio Pharmaceuticals, Inc. and certain of its stockholders, dated August 27, 2018.	S-1	333-227474	4.4	September 21, 2018
4.4	Warrant to Purchase Shares of Common Stock, issued by PhaseBio Pharmaceuticals, Inc. to Silicon Valley Bank on March 25, 2019.	10-K	001-38697	4.4	March 26, 2019
4.5	Warrant to Purchase Shares of Common Stock, issued by PhaseBio Pharmaceuticals, Inc. to WestRiver Innovation Lending Fund VIII, L.P. on March 25, 2019.	10-K	001-38697	4.5	March 26, 2019
4.6	Warrant to Purchase Shares of Common Stock, issued by PhaseBio Pharmaceuticals, Inc. to WestRiver Innovation Lending Fund VIII, L.P. on July 26, 2019.	10-Q	001-38697	4.6	August 14, 2019
4.7	Warrant to Purchase Shares of Common Stock, issued by PhaseBio Pharmaceuticals, Inc. to Silicon Valley Bank on July 26, 2019.	10-Q	001-38697	4.7	August 14, 2019

Exhibit Number	Exhibit Title	Incorporated by Reference			
		Form	File No.	Exhibit	Filing Date
4.8	Warrant to Purchase Shares of Common Stock, issued by PhaseBio Pharmaceuticals, Inc. to Silicon Valley Bank on October 2, 2019.	10-Q	001-38697	4.8	November 14, 2019
4.9	Warrant to Purchase Shares of Common Stock, issued by PhaseBio Pharmaceuticals, Inc. to WestRiver Innovation Lending Fund VIII, L.P. on October 2, 2019.	10-Q	001-38697	4.9	November 14, 2019
4.10	Warrant to Purchase Shares of Common Stock, issued by PhaseBio Pharmaceuticals, Inc. to SFJ Pharmaceuticals X, Ltd. on January 9, 2020	10-K	001-38697	4.10	March 30, 2020
4.11	Description of PhaseBio Pharmaceuticals, Inc. Common Stock	10-K	001-38697	4.11	March 30, 2020
10.1+	2018 Equity Incentive Plan and Forms of Stock Option Grant Notice and Agreement and Restricted Stock Unit Grant Notice and Agreement thereunder.	S-8	333-227935	10.2	October 22, 2018
10.2+	2018 Employee Stock Purchase Plan.	S-8	333-227935	10.3	October 22, 2018
10.3#	Non-Employee Director Compensation Policy, as amended.				
10.4+	Form of Indemnification Agreement by and between PhaseBio Pharmaceuticals, Inc. and each of its directors and executive officers.	S-1/A	333-227474	10.5	October 5, 2018
10.5+	Severance Benefit Plan and Form of Participation Agreement.	S-1/A	333-227474	10.6.1	October 5, 2018
10.6+	Amended and Restated 2002 Stock Plan and Form of Option Agreement and Exercise Notice thereunder, as amended to date.	S-1	333-227474	10.1	September 21, 2018
10.7+	Offer Letter, dated as of November 19, 2012, by and between PhaseBio Pharmaceuticals, Inc. and Jonathan P. Mow, as amended to date.	S-1	333-227474	10.7	September 21, 2018
10.8+	Offer Letter, dated as of March 13, 2016, by and between PhaseBio Pharmaceuticals, Inc. and John Sharp.	S-1	333-227474	10.8	September 21, 2018
10.9+	Offer Letter, dated as of November 19, 2012, by and between PhaseBio Pharmaceuticals, Inc. and John Lee, M.D., Ph.D.	S-1	333-227474	10.9	September 21, 2018

Exhibit Number	Exhibit Title	Incorporated by Reference			
		Form	File No.	Exhibit	Filing Date
10.10†	License Agreement, dated as of October 18, 2017 and as amended to date, by and between Phase Bioscience, Inc. (predecessor to PhaseBio Pharmaceuticals, Inc.) and Duke University	S-1	333-227474	10.10	September 21, 2018
10.11††	Eighth Amendment to License Agreement, dated as of March 5, 2019, by and between PhaseBio Pharmaceuticals, Inc. and Duke University.	8-K	001-38697	10.1	April 9, 2019
10.12†	License Agreement, dated as of November 21, 2017, by and between PhaseBio Pharmaceuticals, Inc. and MedImmune Limited.	S-1	333-227474	10.11	September 21, 2018
10.13	Amendment to License Agreement, dated January 9, 2020, by and between PhaseBio Pharmaceuticals, Inc. and MedImmune Limited	10-K	001-38697	10.13	March 30, 2020
10.14	Loan and Security Agreement, dated as of October 18, 2017 and as amended to date, by and between PhaseBio Pharmaceuticals, Inc. and Silicon Valley Bank.	S-1	333-227474	10.12	September 21, 2018
10.15	Loan and Security Agreement, dated as of March 25, 2019, by and among PhaseBio Pharmaceuticals, Inc. and Silicon Valley Bank and WestRiver Innovation Lending Fund VIII, L.P.	10-K	001-38697	10.13	March 26, 2019
10.16	Consent and First Amendment to Loan and Security Agreement, dated as of March 19, 2020, by and among PhaseBio Pharmaceuticals, Inc. and Silicon Valley Bank and WestRiver Innovation Lending Fund VIII, L.P.	10-K	001-38697	10.16	March 30, 2020
10.17	Subordination Agreement, dated as of March 19, 2020, by and among Silicon Valley Bank, WestRiver Innovation Lending Fund VIII, L.P. and SFJ Pharmaceuticals X, Ltd.	10-K	001-38697	10.17	March 30, 2020
10.18††	Intellectual Property Security Agreement, dated as of March 19, 2020, by and among PhaseBio Pharmaceuticals, Inc. and Silicon Valley Bank and WestRiver Innovation Lending Fund VIII, L.P.	10-K	001-38697	10.18	March 30, 2020
10.19††	Master Services Agreement, dated as of November 14, 2018, by and between PhaseBio Pharmaceuticals, Inc. and BioVectra Inc.	10-K	001-38697	10.14	March 26, 2019

Exhibit Number	Exhibit Title	Incorporated by Reference			
		Form	File No.	Exhibit	Filing Date
10.20	Lease Agreement, dated as of January 15, 2010 and as amended to date, by and between PhaseBio Pharmaceuticals, Inc. and Liberty Property Limited Partnership.	S-1	333-227474	10.13	September 21, 2018
10.21††	Co-Development Agreement, dated January 9, 2020, by and between PhaseBio Pharmaceuticals, Inc. and SFJ Pharmaceuticals X, Ltd.	10-K	001-38697	10.21	March 30, 2020
10.22††	Form of Program Transfer Agreement by and between PhaseBio Pharmaceuticals Inc. and SFJ Pharmaceuticals X. Ltd.	10-K	001-38697	10.22	March 30, 2020
10.23††	Asset Purchase Agreement, dated January 13, 2020, by and between PhaseBio Pharmaceuticals, Inc., Viamet Pharmaceuticals Holdings, LLC and Selenity Therapeutics (Bermuda), Ltd.	10-K	001-38697	10.23	March 30, 2020
23.1#	Consent of KPMG LLP				
24.1#	Power of Attorney (included on signature page)				
31.1#	Certification of Chief Executive Officer and President (Principal Executive Officer), pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.				
31.2#	Certification of Chief Financial Officer (Principal Financial Officer), pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.				
32.1#*	Certification of Chief Executive Officer (Principal Executive Officer), pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.				
32.2#*	Certification of Chief Financial Officer (Principal Financial Officer), pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.				
101.INS#	XBRL Instance Document.				
101.SCH#	XBRL Taxonomy Extension Schema Document.				
101.CAL#	XBRL Taxonomy Extension Calculation Linkbase Document.				
101.DEF#	XBRL Taxonomy Extension Definition Linkbase Document.				
101.LAB#	XBRL Taxonomy Extension Label Linkbase Document.				

Exhibit Number	Exhibit Title	Incorporated by Reference			
		Form	File No.	Exhibit	Filing Date
101.PRE#	XBRL Taxonomy Extension Presentation Linkbase Document.				

Filed herewith.
+ Indicates management contract or compensatory plan.
† Confidential treatment has been granted for certain portions of this exhibit (indicated by asterisks). Such information has been omitted and was filed separately with the Securities and Exchange Commission.
†† Certain portions of this exhibit (indicated by asterisks) have been omitted because they are not material and would likely cause competitive harm to PhaseBio Pharmaceuticals, Inc. if publicly disclosed.
* These certifications are being furnished solely to accompany this quarterly report pursuant to 18 U.S.C. Section 1350, and are not being filed for purposes of Section 18 of the Securities Exchange Act of 1934, as amended, and are not to be incorporated by reference into any filing of the registrant, whether made before or after the date hereof, regardless of any general incorporation language in such filing.

Item 16. Form 10-K Summary

Not applicable.

SIGNATURES

Pursuant to the requirements of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned thereunto duly authorized.

PHASEBIO PHARMACEUTICALS INC.

March 15, 2021

By: /s/ John P. Sharp

John P. Sharp
Chief Financial Officer
(*On behalf of the registrant and in his capacity as Principal Financial Officer and Principal Accounting Officer*)

KNOW ALL PERSONS BY THESE PRESENTS, that each person whose signature appears below constitutes and appoints Jonathan P. Mow and John P. Sharp, jointly and severally, as his or her true and lawful attorneys-in-fact and agents, with full power of substitution and resubstitution, for him or her and in his or her name, place and stead, in any and all capacities, to sign this Annual Report on Form 10-K of PhaseBio Pharmaceuticals, Inc., and any or all amendments thereto, and to file the same, with all exhibits thereto, and other documents in connection therewith, with the Securities and Exchange Commission, granting unto said attorneys-in-fact and agents full power and authority to do and perform each and every act and thing requisite or necessary to be done in and about the premises hereby ratifying and confirming all that said attorneys-in-fact and agents, or his, her or their substitute or substitutes, may lawfully do or cause to be done by virtue hereof. Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed below by the following persons on behalf of the registrant and in the capacities and on the dates indicated.

Signature	Title	Date
/s/ Jonathan P. Mow Jonathan P. Mow	Chief Executive Officer and Director *(Principal Executive Officer)*	March 15, 2021
/s/ John P. Sharp John P. Sharp	Chief Financial Officer *(Principal Financial Officer and Principal Accounting Officer)*	March 15, 2021
/s/ Clay B. Thorp Clay B. Thorp	Chairman of the Board of Directors	March 15, 2021
/s/ Edmund P. Harrigan, M.D. Edmund P. Harrigan, M.D.	Director	March 15, 2021
/s/ Nancy J. Hutson, Ph.D. Nancy J. Hutson, Ph.D.	Director	March 15, 2021
/s/ Peter Justin Klein, M.D., J.D. Peter Justin Klein, M.D., J.D.	Director	March 15, 2021
/s/ Caroline M. Loewy Caroline M. Loewy	Director	March 15, 2021
/s/ Alex C. Sapir Alex C. Sapir	Director	March 15, 2021
/s/ Richard A. van den Broek Richard A. van den Broek	Director	March 15, 2021

Exhibit 10.3

PhaseBio Pharmaceuticals, Inc.

Non-Employee Director Compensation Policy
As Amended February 9, 2021

Each member of the Board of Directors (the "***Board***") who is not also serving as an employee of or consultant to PhaseBio Pharmaceuticals, Inc. (the "***Company***") or any of its subsidiaries (each such member, an "***Eligible Director***") will receive the compensation described in this Non-Employee Director Compensation Policy for his or her Board service. An Eligible Director may decline all or any portion of his or her compensation by giving notice to the Company prior to the date cash may be paid or equity awards are to be granted, as the case may be. This policy originally became effective upon the date of the underwriting agreement between the Company and the underwriters managing the initial public offering of the Company's common stock (the "***Common Stock***"), pursuant to which the Common Stock was priced in such initial public offering and may be amended at any time in the sole discretion of the Board or the Compensation Committee of the Board.

Annual Cash Compensation

The annual cash compensation amount set forth below is payable to Eligible Directors in equal quarterly installments, payable in arrears on the last day of each fiscal quarter in which the service occurred. If an Eligible Director joins the Board or a committee of the Board at a time other than effective as of the first day of a fiscal quarter, each annual retainer set forth below will be pro-rated based on days served in the applicable fiscal year, with the pro-rated amount paid for the first fiscal quarter in which the Eligible Director provides the service and regular full quarterly payments thereafter. All annual cash fees are vested upon payment.

1. Annual Board Service Retainer:
    a. All Eligible Directors: $40,000
    b. Chairman of the Board Service Retainer (in addition to Eligible Director Service Retainer): $30,000

2. Annual Committee Chair Service Retainer:
    a. Chairman of the Audit Committee: $15,000
    b. Chairman of the Compensation Committee: $12,000
    c. Chairman of the Nominating and Corporate Governance Committee: $10,000

3. Annual Committee Member Service Retainer (not applicable to Committee Chairs):
    a. Member of the Audit Committee: $7,500
    b. Member of the Compensation Committee: $6,000
    c. Member of the Nominating and Corporate Governance Committee: $5,000

Equity Compensation

The equity compensation set forth below will be granted under the Company's 2018 Equity Incentive Plan (the "***Plan***"). All stock options granted under this policy will be nonstatutory stock options, with an exercise price per share equal to 100% of the Fair Market Value (as defined in the Plan) of the underlying Common Stock on the date of grant, and a term of ten years from the date of grant (subject to earlier termination in connection with a termination of service as provided in the Plan, provided that upon a termination of service other than for death, disability or cause, the post-termination exercise period will be 12 months from the date of termination).

1. Initial Grant: For each Eligible Director who is first elected or appointed to the Board, on the date of such Eligible Director's initial election or appointment to the Board (or, if such date is not a market trading day, the first market trading day thereafter), the Eligible Director will be automatically, and without further action by the Board or Compensation Committee of the Board, granted a stock option to purchase 28,000 shares of Common Stock (the "***Initial Grant***"). The shares subject to each Initial Grant will vest in equal monthly installments over a three year period such that the option is fully vested on the third anniversary of the date of grant, subject to the Eligible Director's Continuous Service (as defined in the Plan) through each such vesting date and will vest in full upon a Change in Control (as defined in the Plan).

2. Annual Grant: On the date of each annual stockholder meeting of the Company, each Eligible Director who continues to serve as a non-employee member of the Board following such stockholder meeting will be automatically, and without further action by the Board or Compensation Committee of the Board, granted a stock option to purchase 14,000 shares of Common Stock (the "***Annual Grant***"). Notwithstanding the foregoing, if an Eligible Director joined the Board upon or after the date of the last preceding annual stockholder meeting of the Company, such Eligible Director's Annual Grant will be pro-rated based on days served since joining the Board until the annual stockholder meeting of the Company. For the avoidance of doubt, Eligible Directors who join the Board at an annual stockholder meeting are not eligible to receive an Annual Grant for such annual stockholder meeting.

The shares subject to the Annual Grant will vest upon the earlier of the (i) one year anniversary of the date of grant and (b) the date of Company's next annual stockholder meeting, in any case subject to the Eligible Director's Continuous Service (as defined in the Plan) through such vesting date and will vest in full upon a Change in Control (as defined in the Plan).

Exhibit 23.1

Consent of Independent Registered Public Accounting Firm

The Board of Directors
PhaseBio Pharmaceuticals, Inc.:

We consent to the incorporation by reference in the registration statements (Nos. 333-227935, 333-230504 and 333-237462) on Form S-8 and in the registration statement (No. 333-235735) on Form S-3 of PhaseBio Pharmaceuticals, Inc. of our report dated March 15, 2021, with respect to the balance sheets of PhaseBio Pharmaceuticals, Inc. as of December 31, 2020 and 2019, the related statements of operations, stockholders' (deficit) equity, and cash flows for the years then ended, and the related notes (collectively, the financial statements), which report appears in the December 31, 2020 annual report on Form 10-K of PhaseBio Pharmaceuticals, Inc.

Our report dated March 15, 2021 contains an explanatory paragraph that states that PhaseBio Pharmaceuticals, Inc. has incurred recurring losses and negative cash flows from operations and has an accumulated deficit of $260.7 million as of December 31, 2020 that raise substantial doubt about its ability to continue as a going concern. The financial statements do not include any adjustments that might result from the outcome of this uncertainty.

/s/ KPMG LLP

Philadelphia, Pennsylvania
March 15, 2021

Exhibit 31.1

CERTIFICATION PURSUANT TO
RULES 13a-14(a) AND 15d-14(a) UNDER THE SECURITIES EXCHANGE ACT OF 1934,
AS ADOPTED PURSUANT TO SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002

I, Jonathan P. Mow, certify that:

1. I have reviewed this Annual Report on Form 10-K of PhaseBio Pharmaceuticals, Inc.;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant’s other certifying officer(s) and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) for the registrant and have:

   (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

   (b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of the financial statements for external purposes in accordance with generally accepted accounting principles;

   (c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

   (d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer(s) and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

   (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

   (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: March 15, 2021

By: /s/ Jonathan P. Mow
Jonathan P. Mow
Chief Executive Officer

Exhibit 31.2

CERTIFICATION PURSUANT TO
RULES 13a-14(a) AND 15d-14(a) UNDER THE SECURITIES EXCHANGE ACT OF 1934,
AS ADOPTED PURSUANT TO SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002

I, John Sharp, certify that:

1. I have reviewed this Annual Report on Form 10-K of PhaseBio Pharmaceuticals, Inc.;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant’s other certifying officer(s) and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) for the registrant and have:

   (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

   (b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of the financial statements for external purposes in accordance with generally accepted accounting principles;

   (c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

   (d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer(s) and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

   (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

   (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: March 15, 2021

By: /s/ John P. Sharp
John P. Sharp
Chief Financial Officer

Exhibit 32.1

CERTIFICATION PURSUANT TO
18 U.S.C. SECTION 1350, AS ADOPTED PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

In connection with the Annual Report of PhaseBio Pharmaceuticals, Inc. (the "Company") on Form 10-K for the period ended December 31, 2020 as filed with the Securities and Exchange Commission on the date hereof (the "Report"), I certify, pursuant to 18 U.S.C. § 1350, as adopted pursuant to § 906 of the Sarbanes-Oxley Act of 2002, that, to the best of my knowledge:

(1) The Report fully complies with the requirements of Section 13(a) or Section 15(d) of the Securities Exchange Act of 1934, as amended; and

(2) The information contained in the Report fairly presents, in all material respects, the financial condition and result of operations of the Company.

Date: March 15, 2021

By: /s/ Jonathan P. Mow
Jonathan P. Mow
Chief Executive Officer

The foregoing certification is being furnished solely to accompany the Report pursuant to 18 U.S.C. § 1350, and is not being filed for purposes of Section 18 of the Securities Exchange Act of 1934, as amended, and is not to be incorporated by reference into any filing of the Company, whether made before or after the date hereof, regardless of any general incorporation language in such filing. A signed original of this written statement required by Section 906 has been provided to the Company and will be retained by the Company and furnished to the Securities and Exchange Commission or its staff upon request.

Exhibit 32.2

CERTIFICATION PURSUANT TO
18 U.S.C. SECTION 1350, AS ADOPTED PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

In connection with the Annual Report of PhaseBio Pharmaceuticals, Inc. (the "Company") on Form 10-K for the period ending December 31, 2020 as filed with the Securities and Exchange Commission on the date hereof (the "Report"), I certify, pursuant to 18 U.S.C. § 1350, as adopted pursuant to § 906 of the Sarbanes-Oxley Act of 2002, that, to the best of my knowledge:

(1) The Report fully complies with the requirements of Section 13(a) or Section 15(d) of the Securities Exchange Act of 1934; as amended; and

(2) The information contained in the Report fairly presents, in all material respects, the financial condition and result of operations of the Company.

Date: March 15, 2021

By: /s/ John Sharp
John Sharp
Chief Financial Officer

The foregoing certification is being furnished solely to accompany the Report pursuant to 18 U.S.C. § 1350, and is not being filed for purposes of Section 18 of the Securities Exchange Act of 1934, as amended, and is not to be incorporated by reference into any filing of the Company, whether made before or after the date hereof, regardless of any general incorporation language in such filing. A signed original of this written statement required by Section 906 has been provided to the Company and will be retained by the Company and furnished to the Securities and Exchange Commission or its staff upon request.