UNITED STATES
SECURITIES AND EXCHANGE COMMISSION

Washington, D.C. 20549

FORM 10-K

(Mark One)

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

For the fiscal year ended December 31, 2018

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 001-38419

Arcus Biosciences, Inc.

(Exact name of Registrant as specified in its Charter)

Delaware	**47-3898435**
(State or other jurisdiction of incorporation or organization)	**(I.R.S. Employer Identification No.)**

3928 Point Eden Way
Hayward, CA 94545
(Address of principal executive offices)

Registrant's telephone number, including area code: (510) 694-6200

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

Titles of Each Class	**Name of Each Exchange on which Registered**
Common Stock, Par Value $0.0001 Per Share	The New York Stock Exchange

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 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 if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K (§229.405) is not contained herein, and will not be contained, to the best of Registrant's knowledge, in definitive proxy or information statements incorporated by reference in Part III of this Form 10-K or any amendment to this Form 10-K. ☒

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 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, based on the closing price of the shares of common stock on The New York Stock Exchange on June 30, 2018, was $446,627,012.

The number of shares of Registrant's Common Stock outstanding as of March 1, 2019 was 44,534,594.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the Registrant's Definitive Proxy Statement relating to the 2019 Annual Meeting of Shareholders, scheduled to be held on June 6, 2019, are incorporated by reference into Part III of this Report. The Definitive Proxy Statement will be filed within 120 days of the Registrant's fiscal year ended December 31, 2018.

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INFORMATION REGARDING FORWARD-LOOKING STATEMENTS

This Annual Report on Form 10-K (Annual Report) includes forward-looking statements. All statements regarding future events, results or other future matters contained in this Annual Report are forward-looking statements, including statements about:

- our expectations regarding the timing and achievement of our product candidate development activities and ongoing and planned clinical trials;
- our expectations for reporting data from clinical trials in certain timeframes;
- our ability to develop intra-portfolio combinations and highly-differentiated small-molecule candidates, including our ability to create small-molecule product candidates with ideal pharmacological properties and desired clinical effects;
- our expectations regarding the efficiency and speed with which we can create and advance small-molecule product candidates and develop our product candidates and combination therapies;
- our reliance on third parties to conduct our ongoing and future clinical trials and third-party manufacturers to manufacture and supply our product candidates;
- our expectations regarding the nature of the immuno-oncology pathways we are targeting, the size of the potential patient population and the potential market size;
- our ability to obtain and maintain control of our combination products and maximize the commercial potential of our product candidates;
- our ability to obtain and maintain regulatory approvals of our product candidates, the potential market opportunities for commercializing our product candidates;
- our ability to retain and recruit key personnel, estimates of our expenses, future revenue, capital requirements and our needs for additional financing;
- our ability to develop, acquire and advance product candidates into, and successfully complete, clinical trials;
- our initiation, timing, progress and results of future research and development programs, preclinical studies and clinical trials;
- our ability to obtain and maintain intellectual property rights covering our product candidates;
- our expectations regarding the developments and projections relating to our competitors; and
- our industry and the time during which we will be an emerging growth company under the Jumpstart Our Business Startups Act of 2012.

The words “believe,” “may,” “will,” “estimate,” “continue,” “anticipate,” “design,” “intend,” “expect,” “could,” “plan,” “potential,” “predict,” “seek,” “should,” “would” or the negative version of these words and similar expressions are intended to identify forward-looking statements. We have based these forward-looking statements on our current expectations and projections about future events and trends that we believe may affect our financial condition, results of operations, strategy, short- and long-term business operations and objectives and financial needs.

These forward-looking statements are subject to a number of risks, uncertainties and assumptions, including those described in "Risk Factors." Moreover, we operate in a very competitive and rapidly changing environment. New risks emerge from time to time. It is not possible for our management to predict all risks, nor can we assess the impact of all factors on our business or the extent to which any factor, or combination of factors, may cause actual results to differ materially from those contained in any forward-looking statements we may make. In light of these risks, uncertainties and assumptions, the forward-looking events and circumstances discussed in this Annual Report may not occur and actual results could differ materially and adversely from those anticipated or implied in the forward-looking statements.

You should not rely upon forward-looking statements as predictions of future events. Although we believe that the expectations reflected in the forward-looking statements are reasonable, we cannot guarantee that the future results, advancements, discoveries, levels of activity, performance or events and circumstances reflected in the forward-looking statements will be achieved or occur. Moreover, except as required by law, neither we nor any other person assumes responsibility for the accuracy and completeness of the forward-looking statements. We undertake no obligation to update publicly any forward-looking statements for any reason after the date of this Annual Report to conform these statements to actual results or to changes in our expectations.

PART I

Item 1. Business

Company Overview

We are a clinical-stage biopharmaceutical company focused on creating innovative cancer immunotherapies by leveraging underexploited biological opportunities. Specifically, we target well-characterized biological pathways with significant scientific data supporting their importance in regulating the immune response against cancer and for which either there are no molecules in development or those that exist have suboptimal profiles. To exploit these pathways, we have built a robust and highly efficient discovery capability to create and optimize highly differentiated small-molecule immuno-oncology product candidates. Since our inception in 2015, we have built a broad portfolio of small-molecule and antibody product candidates that we plan to develop together as intra-portfolio combinations.

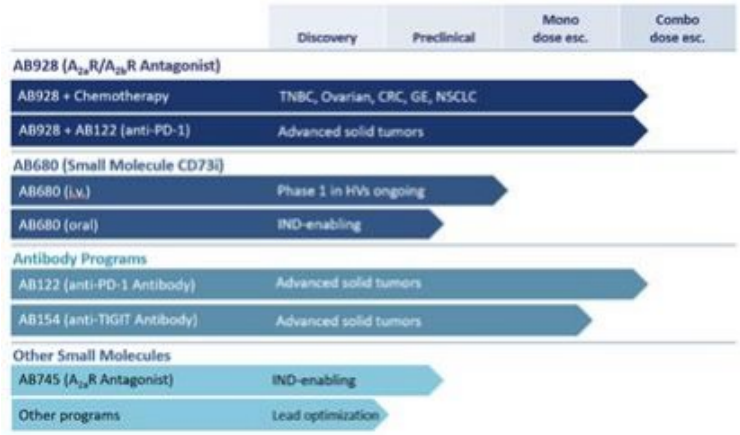
Our most advanced small-molecule product candidate, AB928, is in a Phase 1/1b program to evaluate it in combination with chemotherapy and with our anti-PD-1 antibody, AB122. We expect to report dose-escalation data for certain of these combinations and initiate dose-expansion studies in 2019. We have also initiated clinical trials for our two antibody product candidates, AB122 and AB154 (our anti-TIGIT antibody) and advanced our fourth product candidate, AB680 (a small molecule CD73 inhibitor) into a clinical trial in healthy volunteers in 2018.

Our initial focus is on the ATP-adenosine pathway, a key driver of immunosuppression in the tumor microenvironment. Decades of scientific research have demonstrated that extracellular adenosine, generated by the CD73 enzyme, acts as a powerful inhibitor of immune cell activity. The compelling therapeutic rationale for inhibition of the ATP-adenosine pathway has led several companies to repurpose for oncology existing adenosine $A_{2a}R$ receptor antagonists that were originally designed for the treatment of central nervous system (CNS) indications. We believe that our lead product candidate, AB928, which we designed using our small-molecule discovery capability, is the first adenosine receptor antagonist that effectively blocks the adenosine receptor in the tumor microenvironment and potently inhibits both the adenosine 2a receptor ($A_{2a}R$) and the adenosine 2b receptor ($A_{2b}R$). Our *in vitro* studies have demonstrated that AB928 reverses adenosine-induced immunosuppression and inhibits the $A_{2a}R$ and $A_{2b}R$ receptors more potently and effectively than the other adenosine receptor antagonists in clinical development. In addition to AB928, we have created a small-molecule inhibitor of CD73, AB680, which could represent another powerful approach to inhibiting the ATP-adenosine pathway and have generated additional potential product candidates against ATP-adenosine and other important immuno-oncology pathways using our internal discovery capability.

As the immuno-oncology market evolves toward the use of combination therapies, a key element of our strategy is to build a broad portfolio of product candidates that target a wide range of immune mechanisms, which will enable us to pursue multiple intra-portfolio combinations. Consistent with this strategy, we are developing antibody drug candidates that are currently considered the foundation for combination therapies in immuno-oncology, or backbone therapy, or that have the potential to be future backbone therapies, such as our in-licensed antibodies targeting the immune checkpoint receptors PD-1 and TIGIT. Our strategy is to create differentiated combination products by combining these antibodies with our internally discovered small-molecule product candidates.

Our Product Portfolio

The following chart summarizes our product pipeline. We currently hold world-wide rights to all of our product candidates other than the rights to AB122 in China and five other countries that are outside of the United States, Europe and Japan. In addition, Taiho Pharmaceutical Co., Ltd. (Taiho) has an option to exclusively license the development and commercialization rights to each of our programs for Japan and certain other territories in Asia (excluding China).



TNBC: triple negative breast cancer; CRC: colorectal cancer; GE: gastroesophageal cancer; NSCLC: non-small cell lung cancer.

We currently have four clinical-stage product candidates, the profiles of which are summarized below:

- ***AB928.*** Our lead adenosine receptor antagonist, AB928, is an orally bioavailable, highly potent, reversible antagonist of the A2aR and A2bR receptors. We believe that AB928 is the first adenosine receptor antagonist in clinical development to be designed specifically for the biology of the tumor microenvironment and has multiple advantages over other adenosine receptor antagonists in clinical development, including: (i) significantly greater potency under conditions that closely resemble the tumor microenvironment, for example, high concentrations of adenosine and albumin, (ii) inhibition of both the A2aR and A2bR receptors, (iii) low penetration through the blood-brain barrier, (iv) high penetration of tumor tissue and (v) attractive pharmacokinetics, with high oral bioavailability and a human half-life that enables once-daily dosing.

  We completed a Phase 1 trial of AB928 in 85 healthy volunteers in 2018 (Seitz, L., Jin, L., Leleti, M. et al. Invest New Drugs (2018). https://doi.org/10.1007/s10637-018-0706-6). This trial provided us with significant insights into the safety, pharmacokinetic and pharmacodynamic profiles of AB928, allowing us to initiate the dose-escalation portions of our combination trials in cancer patients at a pharmacologically relevant dose. We completed the single-ascending-dose and multiple-ascending-dose portions of the healthy volunteer trial, administering daily doses up to 150 mg and 200 mg, respectively, with both doses demonstrating at least 90% inhibition of $A_{2a}R$ activation. All adverse events were low-grade.

  We started enrollment in cancer patients for AB928 in combination with AB122, our anti-PD-1 antibody, and in combination with chemotherapy in the second half of 2018. We are exploring AB928 in a variety of solid tumors supported by biological and commercial rationale, as described in more detail in "—Our Clinical Development Strategy for AB928." We are also focused on the identification of additional molecules that block adenosine receptor signaling and have identified a selective $A_{2a}R$ antagonist (AB745), which is currently undergoing safety assessment in GLP toxicology studies, as well as progressing through CMC (chemistry, manufacturing and controls) development, with the goal of being IND-ready by the fourth quarter of 2019.

- ***AB680.*** Our lead CD73 inhibitor, AB680, is a highly potent, reversible and selective inhibitor of the CD73 enzyme and we believe i t i s the first small-molecule inhibitor of CD73 to enter clinical development. As CD73 plays a critical role in the extracellular generation of adenosine, AB680 may provide a highly effective approach to preventing adenosine-mediated immune suppression. We initiated our first clinical trial for AB680 (intravenous infusion) in healthy volunteers in the second half of 2018. Similar to the AB928 clinical development plan, we plan to follow the healthy volunteer trial with trials that will explore AB680 in combination with other agents in solid tumors in which we believe that the ATP-adenosine pathway plays an important role. Based upon its pharmacokinetic profile in humans , AB680 has the potential to be administered on the same dosing schedule as our anti-PD-1 antibody, AB122, and various chemotherapeutic agents, which would be attractive from a patient compliance and commercial perspective. In the second half of 2018, we also advanced into preclinical development an oral formulation of AB680 and expect preclinical development to be completed in 2019.
- ***AB122.*** Our anti-PD-1 antibody, AB122, is a fully human antibody with similar binding affinity and other characteristics to the marketed anti-PD-1 antibodies pembrolizumab and nivolumab. AB122 is currently completing a Phase 1 dose-escalation trial in cancer patients in Australia. Based on the data generated, we selected 240 mg every two weeks (Q2W) as the dosing regimen for AB122. We continue to evaluate different doses and dosing schedules and expect to report additional safety, pharmacokinetic and pharmacodynamic data from this trial in 2019. We expect to initiate an expansion cohort to evaluate AB122 as a single agent in tumor types known to be responsive to an anti-PD-1 therapy in mid-2019. We are also developing AB122 in combination with our other small-molecule and antibody product candidates.
- ***AB154*** . Our anti-TIGIT antibody, AB154, is a humanized antibody that inhibits a unique immune checkpoint target involved in a pathway that plays both inhibitory and stimulatory roles in the immune system. We initiated a Phase 1 dose escalation trial to evaluate AB154 as a single agent and in combination with AB122 in the third quarter of 2018. A variety of tumor types associated with high expression of CD155 and TIGIT will be explored in the dose-expansion portion of this ongoing trial.

While we plan to retain significant economic and commercial rights to our portfolio, we may out-license the rights to our product candidates in certain regions where we are unlikely to pursue commercialization on our own. In 2017, we entered into an option and license agreement with Taiho for the potential development and commercialization of our product candidates in Japan and certain other territories in Asia (excluding China). Under the terms of the agreement, we will receive a non-refundable and non-creditable upfront payment and research payments totaling $35.0 million during the first three years of the agreement. For any program for which Taiho exercises its option for an exclusive license, we will receive an option payment and will be eligible to receive up to $275.0 million in development, regulatory, and commercial milestone payments arising from such program, as well as royalties, ranging from high single digits to mid-teens, on net sales in Taiho's territories. Taiho exercised its rights to our adenosine receptor antagonist program, which includes AB928 and back-up compounds, in 2018.

Opportunities for Combination Therapies

Despite the success of the first generation of immune checkpoint inhibitors, patient response rates for single-agent therapy are relatively low. For example, the first two approved anti-PD-1 antibodies, when administered as single agents, have only demonstrated response rates of approximately 30% in melanoma patients, and the majority of these patients see their disease ultimately progress. In addition, these therapies have not demonstrated meaningful single-agent activity in many of the most prevalent types of cancer, such as breast, prostate, pancreatic, ovarian and colorectal.

To address the limitations of single-agent immuno-oncology therapy, efforts are now focused on combining anti-PD-1/PD-L1 antibodies with other types of drugs. These combination efforts are designed to address the multiple mechanisms that likely prevent effective anti-tumor immunity and are based on the understanding that several immune processes may need to be modulated concurrently to overcome the adaptations that tumors use to escape immunity. For example, in addition to T cells, there are several other types of immune cells that are critical to an effective anti-tumor immune response, which can be dysregulated in cancer. In addition, tumors can affect their microenvironment in ways that suppress effective immune function, thereby creating favorable conditions for tumor growth and proliferation.

The first combination of immuno-oncology agents to be approved by the FDA was the combination of two immune checkpoint inhibitors, the anti-PD-1 antibody nivolumab and the anti-CTLA-4 antibody ipilimumab, for the treatment of advanced metastatic melanoma. While this combination improved survival rates relative to either agent alone, it also resulted in increased toxicities. Regardless, this therapy demonstrates the opportunity for combinations of drugs that target multiple immune mechanisms.

A significant academic and industry effort is now underway to evaluate combinations of anti-PD-1/PD-L1 antibodies with other agents in order to achieve higher response rates and longer overall survival. Despite recent clinical successes with combination therapy, the challenge remains to identify and develop combinations that will ultimately succeed in important clinical settings. We believe that we are uniquely positioned to address this opportunity by pursuing mechanisms and combinations supported by strong biological rationale derived from existing and evolving scientific data sets.

Our Unique Approach to Immuno-Oncology

Our Focus on Scientifically Validated Immuno-Oncology Pathways

To exploit the significant opportunity in the immuno-oncology market in the most efficient manner and to maximize the addressable patient population for our portfolio, we focus on the following:

- ***Scientifically Validated Pathways.*** Academia has spent decades elucidating the biology behind the immune system's role in cancer, generating a large amount of information on pathways and potential therapeutic targets. However, much of this information has yet to be translated into the discovery of high-quality product candidates. We are focusing on biological pathways for which we can leverage this body of existing scientific knowledge to rapidly generate highly differentiated, small-molecule drug candidates and to identify promising combination therapies and clinical settings in which to pursue them. We believe that this approach mitigates our risk and allows us to create and develop high-quality drug candidates targeting critical immune pathways more quickly and efficiently than would otherwise be possible.
- ***Broad Range of Mechanisms*** . We are focused on developing product candidates that act against a broad range of mechanisms that enable tumors to evade eradication by the immune system. The approved checkpoint inhibitors only relieve T cell suppression and do not directly impact other immune cells nor directly enhance immune system function. Collectively, our small molecules and antibodies cover a much broader spectrum of anti-tumor immune mechanisms.
- ***Ubiquitously Important Targets.*** We focus on targets that are ubiquitous, meaning that they are believed to play an important role in a broad range of human cancer types and settings. For example, CD73, the key enzyme responsible for the generation of extracellular adenosine, has been found to be over-expressed in many tumor types, including non-small cell lung cancer, colorectal cancer, gastroesophageal cancer, breast cancer (particularly triple-negative breast cancer), ovarian cancer, and others, suggesting that it plays a broad immuno-protective role in tumor survival. In fact, high levels of CD73 expression in certain tumors have been shown to correlate with reduced survival rates and reduced responses to certain chemotherapy and immuno-oncology agents. Given the broad applicability of our targets, we are evaluating AB928 in multiple tumor types utilizing trials that will allow us to explore several combination settings in parallel, starting with relatively small patient cohorts. We believe that our focus on targets and pathways that are ubiquitously involved in cancer will enable our product candidates to address broad patient populations and significant market opportunities.

Our Approach to Building a Broad and Differentiated Portfolio

To exploit the potential of these scientifically well understood immuno-oncology pathways and targets, we are focusing our internal discovery effort on novel small-molecule product candidates. While all immuno-oncology agents approved to date are large molecules, such as the anti-PD-1, anti-PD-L1 and anti-CTLA-4 antibodies, we believe that both small and large molecule modalities will be critical in addressing the many different immune-mediated pathways that may be dysregulated in a patient's tumor. As many immuno-oncology pathways are not amenable to intervention by antibodies or protein therapeutics, we expect that small-molecule approaches will allow us to access a significantly greater number of potential targets, including intracellular and extracellular enzymes, G-protein coupled receptors (GPCRs), and kinases. In addition, in some cases, small molecules may prove superior to large-molecule approaches against the same target. For example, we have shown in *in vitro* studies that our small-molecule CD73 inhibitors can achieve a greater degree of CD73 inhibition than certain antibodies against this target that are in clinical development.

Our internal discovery effort is designed to create and advance small-molecule product candidates with the ideal pharmacological properties for the tumor micro-environment and the target of interest. Small-molecule drugs against the same biological target can be highly differentiated from each other based on their respective pharmacokinetic, pharmacodynamic and biophysical properties. For example, many small-molecule drugs are potent when tested in buffer solution but lose a significant amount of this potency in physiologically relevant media such as blood or tumor tissue, due to a phenomenon known as "plasma protein binding" in which compounds bind non-specifically to albumin and other abundant proteins found in such tissues. We rigorously test our molecules in whole blood or other physiologically relevant systems and only advance molecules that retain a high degree of activity when tested under such "real world" conditions . We also design our molecules to have the ideal pharmacological properties for the targeted pathway and the desired clinical effect. For example, we specifically designed our A_2R antagonist AB928 to have a greatly reduced ability to cross the blood brain barrier, as we believe that this attribute will allow us to dose the compound at higher levels before the appearance of any potential adverse events associated with inhibition of the $A_{2a}R$ receptor in the brain. We also designed AB928 to inhibit both the $A_{2a}R$ and $A_{2b}R$ receptors, as we believe that a dual A_2R antagonist will have broader immunological and anti-tumor activity than a selective $A_{2a}R$ antagonist.

To support our strategy of pursuing multiple intra-portfolio combinations, we are building a diverse portfolio of product candidates that target different immune mechanisms. In addition to small molecules, we are also developing antibody product candidates that target what we believe are some of the most important immune checkpoint receptors, including PD-1 and TIGIT, and that we expect to be critical components of our future intra-portfolio combinations. By combining these antibody candidates with our internally discovered small-molecule product candidates, we believe we can create highly differentiated combination products. We also plan to fully explore potential synergies between our molecules and standard-of-care treatments, such as chemotherapy, when there is a strong biological rationale, such as the case of combining our ATP-adenosine pathway inhibitors AB928 and AB680 with certain chemotherapeutic agents.

Given that the treatment of cancer continues to evolve towards the use of agents that are specific for particular tumor profiles, we are exploring biomarkers that may predict a patient's response to treatment. Patients' tumors being considered for immune-based therapies are already routinely tested for certain markers, such as PD-L1 expression or the absence of DNA-repair mechanisms, to determine whether they are appropriate candidates for anti-PD-1 or PD-L1 therapy. In certain settings, we may incorporate biomarker screening into our clinical trials to increase the likelihood of success by focusing on patients that are most likely to respond to our product candidates. In our AB928 combination trials, we are measuring CD73 levels in all enrolled patients in order to determine the value of incorporating screening for CD73 expression into our future clinical trials.

Our Approach to Clinical Development

Our approach to clinical development is to pursue strategies that allow us to generate meaningful data on our product candidates in the most efficient manner possible, which should allow us to rapidly advance our product candidates through clinical trials. Some of the key elements of our approach include:

- ***Focus our development efforts on combination products, particularly those that are intra-portfolio.*** To maximize the potential of our small-molecule product candidates, we are focusing our development efforts on combining them with other agents that we expect to be synergistic with our small molecules. We have in-licensed two antibody product candidates, both of which we expect to be synergistic with our small molecule product candidates, which allows us to pursue multiple intra-portfolio combinations incorporating our internally discovered small-molecule product candidates. While we have initially focused on the development of doublet therapies, such as the combination of AB928 and AB122, we also plan to pursue triplet therapies, which would incorporate two or three of our product candidates.

- ***Design our clinical trials to advance our compounds as quickly and efficiently as possible*** . Following the identification of our recommended dose from our dose escalation trials, we plan to initiate expansion cohorts in multiple tumor types. We have designed our trials to enable us to quickly close or increase the size of our expansion cohorts based on initial tumor response data generated in that cohort, which we believe is an efficient way to study our product candidates in multiple tumor types. Each cohort will enroll an initial 15 patients and up to a total of 40 patients, a sample size we believe would allow us to make a determination regarding further clinical development options. The trials could allow for the opening of control cohorts in which patients are given just one of the agents present in our drug combinations or the initiation of cohorts exploring triplet combinations.

  For some of our small-molecule product candidates, we may choose to initiate clinical testing in healthy volunteers, as we have done with AB928 and AB680. A healthy volunteer trial allows us to characterize our product candidates in a more controlled setting than is possible in a clinical trial with cancer patients and to evaluate our product candidates in a relatively large number of subjects over a relatively short time period. Healthy volunteer trials allow us to generate data on the safety, pharmacodynamic and pharmacokinetic profiles of our product candidates, providing meaningful information on receptor coverage, half-life, optimal dosing regimen and consistency of the product candidate's activity across human subjects. This information in turn allows us to initiate dosing in cancer patients at a potentially higher dose and with a better understanding of the product candidate's biological and pharmacological profile. For example, we were able to start our dose escalation trials of AB928 in cancer patients at a daily dose of 75 mg, much higher than the starting dose that would have been required by regulatory guidelines related to first human dose selection.

  We may also initiate clinical trials for our product candidates in certain regions outside the United States where it would allow us to accelerate our enrollment times. For example, we initiated our first clinical trial for AB122 in Australia, which we believe allowed us to accelerate the time from regulatory submission to the initiation of dosing in patients relative to what would have been possible in the United States. Most of our other clinical trials in cancer patients were initiated first in Australia to similarly expedite study initiation of these studies, following which we have obtained FDA clearance to initiate patient enrollment in the United States.

- ***Select tumor types and settings based on biological and commercial rationale.*** In selecting tumor types to pursue, we are focusing on those types that are most dependent on the pathways targeted by our agents, such as tumors with high levels of CD73 expression for ATP-adenosine inhibitors. We are also focusing on patient populations and settings where we believe there is still considerable unmet need. As an example, for our AB122 combinations, we are focusing on patient populations that have generally been shown not to be responsive to checkpoint inhibitors such as anti-PD1 and anti-PDL1 antibodies. In the case of our chemotherapy combinations, we are focusing on tumor types in which that particular chemotherapy is already considered the standard of care, such as the case of oxaliplatin-containing regimens in the treatment of colorectal cancer. In addition, we are pursuing settings where significant clinical data already exist for the agent that will be evaluated in combination with our product candidates. We believe that this will allow us to determine whether the data we generate in our expansion cohorts are differentiated from the current standard of care.

Our Strategy

Our objective is to transform the treatment of cancer by creating a broad portfolio of innovative immuno-oncology therapeutics and developing combinations that offer significant improvement over current treatment options. To achieve this objective, we are pursuing the following strategies:

- ***Rapidly advance our lead product candidates and combinations through clinical development in multiple tumor types.*** Three of our product candidates, AB928, AB154 and AB122, are being tested in Phase 1/1b combination trials. Safety, pharmacodynamic and pharmacological data on AB928 from our Phase 1 healthy volunteer trial supported selection of a higher starting dose in our first AB928 clinical trials in cancer patients, which is evaluating doublet combinations of AB928 with various forms of chemotherapy and AB122. In these trials, our goal is to generate sufficiently robust data in certain tumor types to allow us to advance the AB928+chemotherapy and/or the AB928+AB122 combination into a large, randomized trial that could potentially support regulatory approval. We may also pursue exploratory studies of selected triplet therapies within these trials.
- ***Pursue combinations and tumor types based on strong biological rationales.*** We are pursuing therapeutic combinations supported by strong biological rationales that suggest synergy between the agents. For example, activation of $A_{2a}R$ receptors on T cells has been shown to impair the ability of anti-PD-1 antibodies to enhance activation of those T cells, providing a strong rationale for combining anti-PD-1 therapy with our agents that target the ATP-adenosine pathway. We are also selecting tumor types that we believe will be most sensitive to our product candidates' mechanisms of action, such as those that have high CD73 expression and T cell infiltration in the cases of AB928 and AB680. In our later-stage trials, we will likely screen for patients with certain tumor profiles, such as high CD73 expression, which should enhance the likelihood of success of these product candidates. In combination trials that involve AB122, we will determine whether expression level of PD-L1 influences the response rate in a particular tumor type.
- ***Control, or otherwise secure access to, all the components of our desired therapeutic combinations.*** As anti-PD-1/PD-L1 antibodies are currently considered the backbone therapy of immuno-oncology treatment, we believed that it was critical to ensure access to this type of molecule to pursue and control the development of multiple intra-portfolio combinations. In 2017, we in-licensed an IND-ready anti-PD-1 antibody from WuXi Biologics. We also in-licensed a preclinical-stage anti-TIGIT antibody that we believe has the potential to become a backbone therapy in the future, and we will continue to evaluate and pursue other molecules that we believe will be critical elements of our combination strategy. By having these antibody product candidates in our portfolio, we can better control the clinical trial design and timelines and retain much of the economics of any resulting products that receive regulatory approval.
- ***Continue to expand our pipeline of novel small-molecule product candidates .*** We have initiated clinical trials for four product candidates, including two product candidates that we discovered in-house. Approximately 80% of our workforce is dedicated to research and development, and we plan to continue to invest in our discovery capability and to expand our pipeline. A key element of our portfolio strategy is to create second-generation molecules for our small-molecule programs; these compounds may possess differentiated pharmacological profiles and are generally derived from chemical scaffolds distinct from the one from which the first-generation product candidate was selected. We have selected a selective $A_{2a}R$ antagonist (AB745) as a second-generation or back-up molecule for AB928. F or AB680, the initial intravenous formulation, currently in clinical testing, is being followed by an oral formulation of the same molecule, which we believe will provide unique clinical flexibility in selecting the optimal dosing schedule as a function of various drug combination partners. We are actively working on two early-stage programs aimed at modulating various aspects of the anti-tumor immune response which we believe play an important role in many human cancers. We anticipate selecting a development product candidate from at least one of these new programs and initiating its CMC/preclinical development program during 2019.

- ***Diversify and broaden the scope of small-molecule drug discovery programs.*** We have strategically initiated drug discovery programs in two areas outside immuno-oncology. In oncology , we have initiated efforts against two cancer cell-intrinsic pathways that we believe are important drivers of growth and survival of certain types of cancer. W e are also in the process of initiating drug discovery efforts against a biological pathway that we believe plays an important role in human inflammatory/auto-immune diseases.
- ***Retain significant economic and commercial rights to our programs in key geographic areas.*** We plan to retain significant economic and commercial rights to our portfolio in the United States and certain other regions. We have pursued and will continue to evaluate opportunities to out-license rights to our product candidates in regions in which we are unlikely to pursue development and commercialization on our own, as was the case with our option and license agreement with Taiho for Japan and certain other territories in Asia (excluding China). In the future, we may enter into strategic collaborations with pharmaceutical companies in the United States or Europe if we believe the partnership enables us to accelerate the development and commercialization of our programs while allowing us to retain meaningful rights to our product candidates.

Our ATP-Adenosine Programs

The ATP-Adenosine Pathway and Its Relevance in Cancer

Our initial focus is on the ATP-adenosine pathway, which, when activated, has potent immuno-suppressive effects in the tumor microenvironment, thereby preventing the immune system from recognizing and destroying cancer cells. The activation of this pathway begins with the release from cells of adenosine triphosphate (ATP). Under normal conditions, ATP is found primarily intracellularly, where it is the primary source of cellular energy; however, under conditions of cellular damage or cell death, large amounts of ATP are released extracellularly. On its own, ATP acts as a "danger signal" to alert and activate the innate immune system. However, an enzyme known as CD39 converts the extracellular ATP into adenosine monophosphate (AMP), and another enzyme known as CD73 subsequently converts AMP into adenosine, which has profound immunosuppressive properties. This process, which results in the generation of large amounts of extracellular adenosine, evolved to protect human tissue from excessive inflammation by counteracting the pro-inflammatory effects of ATP. However, cancer cells have hijacked this mechanism to prevent the immune system from efficiently recognizing and eradicating them.

Once generated, adenosine can bind to and activate four different G-protein coupled receptors: A_1 R, A_{2a} R, A_{2b} R and A_3 R. Of these, only the A_{2a} R and A_{2b} R receptors are believed to play a role in intra-tumoral immune suppression as described below:

- ***A_{2a} R.*** The binding of adenosine to the A_{2a} R receptor, which is expressed on T cells, natural killer (NK) cells and myeloid cells, such as dendritic cells, leads to increased intracellular levels of cyclic AMP (cAMP) and the impairment of maturation and/or activation of T cells, NK cells and dendritic cells. This process significantly impairs the activation of the immune system against cancer cells.

  In addition, the relationship between A_{2a} R, PD-1, and T cell receptor (TCR) activation on T cells is becoming increasingly elucidated. Increased cAMP levels induce specific biochemical and transcriptional changes in T cells that interfere with TCR signaling, decrease the levels of certain proteins (such as CD28) necessary for optimal T cell activation and elevate the levels of certain proteins (such as PD-1) that inhibit T cell activation. As a result, A_{2a} R receptor signaling may play a role in development of resistance to anti-PD-1 therapy.
- ***A_{2b} R.*** The binding of adenosine to the A_{2b} R receptor, which is primarily expressed on myeloid cells, further contributes to the impaired maturation/activation of dendritic cells, a process that is critical for the generation of an adaptive immune response against tumor antigens. Activation of the A_{2b} R receptor by adenosine also decreases the anti-tumor activity of pro-inflammatory macrophages (M1). Therefore, adenosine binding to A_{2b} R results in further impairment of the maturation/activation of these myeloid cells and activates a distinct process that protects tumor cells from the immune system.

One of the significant consequences of $A_{2a}R$ and $A_{2b}R$ activation on tumor-infiltrating immune cells is a decrease in effector T cell (T_{eff}) numbers and activity, as well as simultaneous increases in regulatory T cell (T_{reg}) numbers and activity and decreases in inflammatory cytokine production. T_{eff} and T_{reg} play opposite roles in their attack and protection, respectively, of cancer cells. Their numbers and, more importantly, their ratios are frequently indicative of a cancer patient's likely prognosis; specifically, a higher T_{eff} to T_{reg} ratio is generally correlated with a better prognosis.

The enzymes CD39 and CD73 are upregulated in response to various stimuli, such as the hypoxic tumor microenvironment and certain growth factors and cytokines. In addition, the commonly prescribed chemotherapeutic agents oxaliplatin and doxorubicin also induce elevated CD39 and CD73 levels, which may result in an immunosuppressive response that counteracts some of the potentially beneficial effects of these chemotherapies. Consistent with the relationship between hypoxia and elevated CD73 expression, several studies, including those published by Gao et al. (BioMed. Res. Intl. (2014) i.d. 460654; see Table 2), Loi et al. (Proc. Natl. Acad. Sci. (2013) 110(27): 11091-11096), and Inoue et al. (Oncotarget, January 2017), as well as public databases, such as the National Institutes of Health's The Cancer Genome Atlas database, have shown that CD73 is overexpressed in multiple tumor types and that high CD73 expression is correlated with a poor prognosis in many types of cancer. These include non-small-cell lung carcinoma, colorectal cancer, head and neck squamous cell carcinoma, ovarian cancer, triple-negative breast cancer, renal cell carcinoma, prostate cancer and gastroesophageal cancer. These studies demonstrate the broad potential of CD73 inhibition in many oncology settings.

Our Product Candidates Targeting the ATP-Adenosine Pathway

We are pursuing what we consider to be the two most critical targets within the ATP-adenosine pathway: the $A_{2a}R$/$A_{2b}R$ receptors and the enzyme CD73. Due to the significant and growing amount of scientific literature, including papers by Vijayan et al. (Nat. Rev. Cancer (2017) 17: 709-724); Ohta (Front. Immunol. (2016) 7: article 109); and Allard et al. (Curr. Opin. Pharmacol. (2016) 29: 7-16), supporting the critical role of the ATP-adenosine pathway in cancer, several companies have recently repurposed for oncology $A_{2a}R$ receptor-selective antagonists that were originally developed for Parkinson's disease and other CNS disorders. These repurposed molecules were originally developed to inhibit the effects of adenosine in the brain, where adenosine is present in much smaller quantities than in the tumor microenvironment. These molecules were also specifically designed to cross the blood brain barrier, which could limit the use of higher doses in other settings, like oncology, because of the potential for CNS-mediated adverse events.

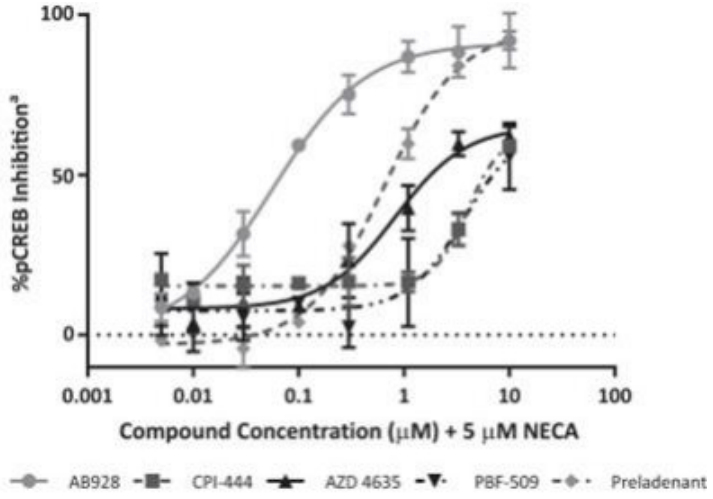
Our Dual Adenosine Receptor Antagonist, AB928

Our most advanced small molecule targeting the ATP-adenosine pathway, AB928, is an orally bioavailable, highly potent, reversible antagonist of the $A_{2a}R$ and $A_{2b}R$ receptors. AB928 is currently in a Phase 1/1b program in cancer patients to evaluate it in combination with chemotherapy and AB122 (our anti-PD-1 antibody). We may also develop AB928 in combination with other agents for which a strong biological rationale exists supporting their synergy with A_2R antagonism.

We believe that AB928 is the first A_2R antagonist in clinical development that inhibits both the $A_{2a}R$ and $A_{2b}R$ receptors and which was designed specifically for the oncology setting. As a result, AB928 has several attributes that differentiate it from the other A_2R antagonists in clinical development, including:

- ***High potency and low plasma protein binding*** . We have shown that AB928 is more potent against $A_{2a}R$ in buffer than the $A_{2a}R$ antagonists currently in clinical development. More importantly, AB928 is significantly more potent than these $A_{2a}R$ antagonists when we evaluated them under conditions that more closely resemble the tumor microenvironment. In these studies, we evaluated AB928 in an assay using whole blood, instead of buffer, and in the presence of high levels of NECA (a synthetic analogue of adenosine). Blood, like tumors, contains much higher concentrations of albumin than the brain. As albumin non-specifically binds to many small-molecule drugs, resulting in a dramatic loss of effective potency, blood represents a more representative biological medium for the evaluation of the potency of small-molecule drugs. The high levels of NECA used in this experiment are representative of the high concentrations of adenosine that have been measured in many solid tumors; these levels can be as much as 100 times higher than those found in the brain. Because the other $A_{2a}R$ antagonists in clinical development were developed with a focus on activity in the brain, they were not necessarily designed to work in the presence of the much higher levels of adenosine that are found in tumors.

When we evaluated AB928 under these conditions, AB928 was significantly more potent at inhibiting A $_{2a}$ R activation, as measured by phosphorylated CREB (pRCEB), than the A $_{2a}$ R antagonists in clinical development, as shown in the graph below. CREB is a transcription factor that becomes phosphorylated when the A $_{2a}$ R is activated; thus, the level of pCREB inhibition is a measure of an A $_{2a}$ R antagonist's ability to inhibit A $_{2a}$ R activation. The table below on the right shows the calculated IC $_{50}$ values for the various compounds in this experiment. The IC $_{50}$ values indicate the concentration of each compound necessary to achieve 50% inhibition of pCREB formation. Therefore, lower values reflect greater compound potency.



Compound	IC_{2a}(nM)
AB928	**80**
CPI-444[b]	~10,000
AZD 4635[c]	2,600
PBF-509[d]	~10,000
Preladenant[e]	785

a Measured in human blood CD8+ T cells; CREB is a transcription factor that becomes phosphorylated when A $_{2}$ aR is activated; thus, the level of pCREB inhibition is a measure of the ability of an A $_{2}$ aR antagonist to inhibit A $_{2}$ aR activation.

b CPI-444: Compound synthesized by Arcus based on structure from AACR, April 2017 (#CT119)

c AZD4635: Compound synthesized by Arcus based on structure from AACR, April 2017 (#2641)

d PBF509: Compound synthesized by Arcus that is believed to be either PBF-509 or a close analogue (based on Pat. Appl. WO2017025918)

e Preladenant was purchased from Ark Pharma (AK-43905); Preladenant was run on a different donor and date than the remaining compounds.

- ***Dual antagonism of the A $_{2a}$ R and A $_{2b}$ R receptors.*** Unlike the repurposed A $_{2a}$ R receptor-selective molecules that were initially developed for CNS indications, we designed our A $_{2}$ R antagonist to optimize its properties for use in immuno-oncology. As such, we designed AB928 to inhibit both the A $_{2a}$ R and A $_{2b}$ R receptors, since the binding of adenosine to A $_{2b}$ R receptors on myeloid cells contributes to adenosine-mediated immune suppression. Therefore, we expect that AB928 could have broader immunological activity than the selective A $_{2a}$ R antagonists. The scientific literature also supports the role of A $_{2b}$ R receptors in different types of cancer, such as triple-negative breast and ovarian cancers.

The following table summarizes data we have generated in our cell-based assays conducted in buffer evaluating the potency of AB928 against A $_{2a}$ R and A $_{2b}$ R, relative to the selective A $_{2a}$ R antagonists. As shown below, AB928 is the most potent inhibitor of A $_{2a}$ R receptors and is the only compound that meaningfully inhibits A $_{2b}$ R receptors.

A $_{2}$ R Antagonist	A $_{2a}$ R (K_B, nM) [c]	A $_{2b}$ R (K_B, nM) [c]
AB928 (Dual A $_{2a}$ R/A $_{2b}$ R Antagonist)	**1.4**	**2.4**
CPI-444 [a,b]	5.4	493
AZD 4635 [a]	1.7	64
PBF-509 [a,b]	58	189
Preladenant [a,b]	3.3	3,121

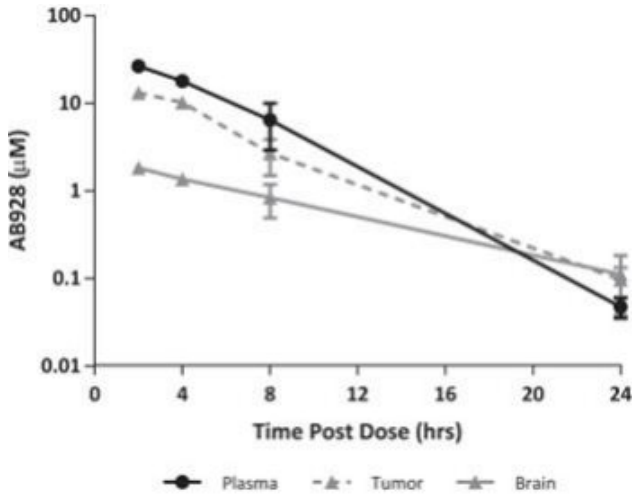
a Arcus data generated with compound samples synthesized or purchased by Arcus.

b CPI-444: Structure from AACR, April 2017 (#CT119), synthesized by Arcus; AZD4635: Structure from AACR, April 2017 (#2641), synthesized by Arcus; PBF509: believed to be PBF-509 or a close analogue (based on Pat Appl WO2017025918), synthesized by Arcus; Preladenant was purchased from Ark Pharma (AK-43905) and was run on a different donor and date than the other compounds.

c K_B is a measure of a compound's thermodynamic ability to bind/block its target receptor; lower K_B values reflect greater potency for a given receptor.

- ***Low penetration across the blood brain barrier.*** Unlike the other A $_{2a}$ R antagonists that were specifically designed to penetrate and act in the brain, we have designed AB928 to minimize penetration of the blood-brain barrier. As shown in the graph below, the concentration of AB928 measured in the brain corresponds to approximately 1% of the concentration found in blood**.** We believe that this characteristic could allow us to dose at levels necessary to achieve high receptor coverage of AB928 in the tumor microenvironment while avoiding the potential for CNS-related toxicities.
- ***High tumor/plasma ratio.*** Another rationale for selecting AB928 as our lead A $_{2a}$ R/A $_{2b}$ R antagonist development candidate is that a relatively high level of the compound penetrates the tumor. The graph below shows the concentration of AB928 in the tumor and plasma over time in tumor-bearing mice and demonstrates that AB928 achieves significant tumor penetration.

Tissue distribution in tumor-bearing mice after a single 30 mg/kg subcutaneous dose of AB928 to CT26-tumor bearing mice



Compound	Tumor/Plasma Ratio	Brain/Plasma Ratio
AB928	>0.60	0.01

- ***Attractive pharmacokinetics*** . We designed AB928 to have high oral bioavailability and a human half-life to support once-daily dosing. Other A_{2a} R antagonists in clinical development are being dosed to patients twice per day, presumably reflecting their relatively low oral bioavailability and/or short half-life in humans. Molecules with good oral bioavailability and long half-lives that can be dosed only once per day generally have lower "peak-to-trough" fluctuations in plasma levels between doses. This is important in cases in which the dose-limiting toxicities of the drugs are associated with high peak plasma levels; in these cases, higher overall drug exposures are possible when those drugs have longer half-lives, such as is the case with AB928. Data from our completed Phase 1 trial in healthy volunteers shows an excellent half-life of approximately 20 hours, which allows for once-daily dosing (see next section for more details) .

Based on the important differentiated characteristics summarized above, we believe that AB928 could prove to have more robust anti-tumor effects and activity in a broader range of tumor types than the A_{2a} R antagonists in clinical development.

Our Clinical Development Strategy for AB928

Our initial development efforts for AB928 are focused on combination trials evaluating AB928 with our anti-PD-1 antibody, AB122, and with certain chemotherapeutics. The rationale for selecting these two combination partners for AB928 are as follows:

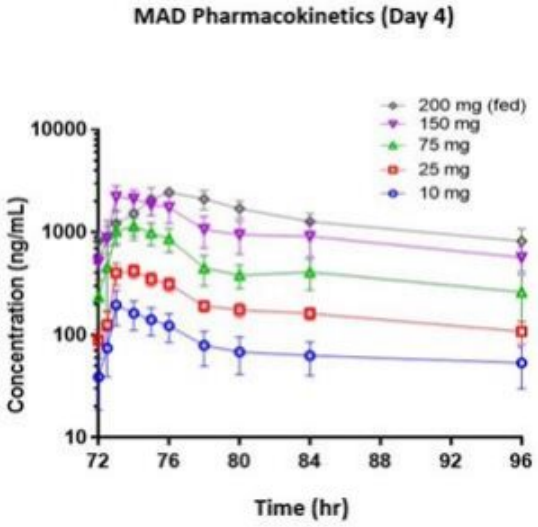
- ***Anti-PD-1 Therapy, such as AB122.*** A_{2a} R activation by adenosine induces biochemical and transcriptional changes in T cells that interfere with TCR signaling, decreases the levels of certain proteins (such as CD28) necessary for optimal T cell activation and elevates levels of certain proteins (such as PD-1) that inhibit T cell activation. As a result, A_{2a} R receptor signaling may play a role in the development of resistance to anti-PD-1 therapy.
- ***Certain Chemotherapy.*** Certain chemotherapies, such as oxaliplatin and doxorubicin, induce *immunogenic cell death* (ICD) in cancer cells, a process that is characterized by, among other features, endoplasmic reticulum stress and enhanced release of ATP into the extracellular environment. In tumors that express high levels of CD73, this ATP is readily converted into adenosine, resulting in profound immune suppression which can counteract the potential anti-tumor effects of chemotherapy.

Our clinical development strategy for AB928 is designed to achieve rapid proof-of-concept in one or more tumor types and to advance AB928 into a registrational trial as quickly as possible. As we expect that the anti-tumor activity of AB928 will result primarily from combination with other agents, we have focused our development efforts on combination trials of AB928 with other mechanisms that are expected to be synergistic with inhibition of the ATP-adenosine pathway, such as anti-PD-1 antibodies and ICD-inducing chemotherapies. In our combination trials, we are focusing on tumor types for which there is substantial evidence that they may rely on the immune-suppressive effects of adenosine. These tumor types share the following characteristics:

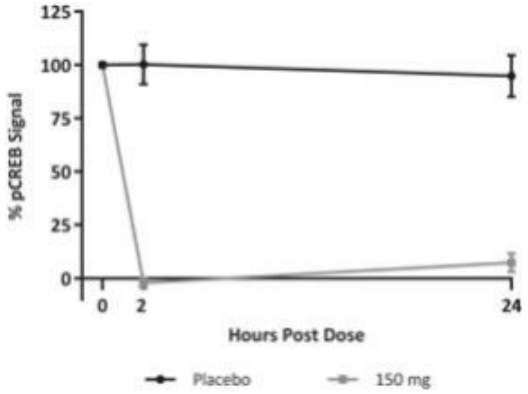
- Infiltration with T cells (as T cells need to be present in the tumor for an adenosine receptor antagonist to have an effect).
- Tumors characterized by high CD73 expression, as evidence that the tumor has the ability to produce adenosine (examples, based on published literature, include non-small-cell lung carcinoma, colorectal cancer, gastroesophageal cancer, ovarian cancer, triple-negative breast cancer, renal cell carcinoma, and pancreatic cancer).
- Anti-PD-1/PD-L1 antibodies or ICD-inducing chemotherapy are currently considered or expected to become the standard of care. Examples include the use of oxaliplatin-containing chemotherapy in colorectal cancer and gastroesophageal cancer; carboplatin in the treatment of non-small cell lung cancer; or the use of anti-PD-1/PD-L1 antibodies in non-small cell lung cancer and renal cell carcinoma.

We completed a Phase 1 trial of AB928 in healthy volunteers in the first half of 2018 (Seitz, L., Jin, L., Leleti, M. et al. Invest New Drugs (2018). https://doi.org/10.1007/s10637-018-0706-6) . This blinded, placebo-controlled trial enrolled 85 subjects at a single site in the Netherlands and included single-ascending-dose and multiple-ascending-dose escalation cohorts. Study subjects were randomized 3:1 to either AB928 or placebo. This trial provided us with significant insights into the safety, pharmacokinetic and pharmacodynamic profiles of AB928, which allowed us to start the dose-escalation portion of our planned combination trials in cancer patients at a higher dose than would otherwise be possible.

We completed both the single-ascending-dose and multiple-ascending-dose portions of this trial, administering single doses of AB928 up to 150 mg in the single-ascending-dose cohorts and 200 mg in the multiple-ascending-dose cohorts in healthy volunteers. At these doses, AB928 demonstrated over 90% inhibition of the $A_{2a}R$ receptor. As shown in the following graph, increasing doses of AB928 resulted in dose proportional increases in plasma levels of AB928. The plasma half-life of AB928 following a single dose has been shown to be approximately 20 hours which supports once daily dosing.



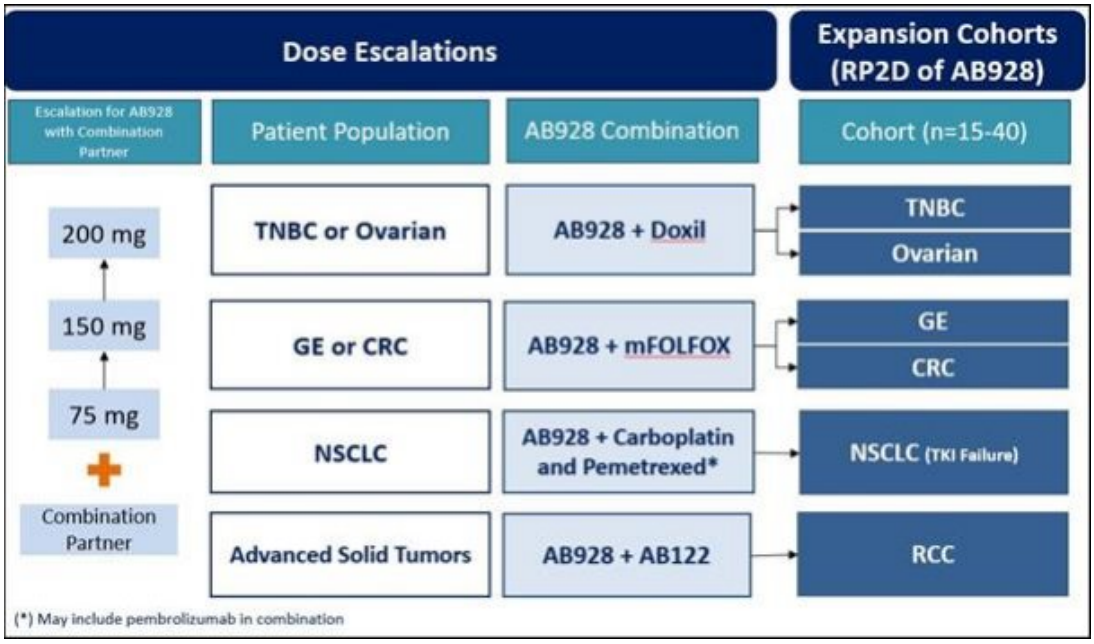
We have developed a pCREB assay to study the pharmacodynamics of AB928, or the degree to which AB928 inhibits pCREB formation (a marker for A $_{2a}$ R inhibition), at each dose level administered in our Phase 1 trial. We collected blood samples from the healthy volunteers at time points corresponding to pre-dose, 2 hours post dose, and 24 hours post dose, incubated these blood samples with 5 µM NECA ex vivo to activate the A $_{2a}$ R receptor and analyzed the samples as described in our earlier pCREB study. The following graph shows data for the 150 mg AB928 single-dose cohort and specifically the mean pCREB activation signal for the pooled placebo group (6 subjects) and for the healthy volunteers receiving 150 mg of AB928 (6 subjects) over the timepoints indicated. Prior to dosing, all subjects responded to 5 µM NECA by increasing the levels of pCREB in their blood CD8+ T cells. As shown in the graph below, two hours after dosing, the placebo group maintained their pCREB activation signal in response to NECA stimulation while the 150 mg AB928 group had no detectable pCREB signal, demonstrating that AB928 was able to completely block the activation of A $_{2a}$ R by NECA. Twenty-four hours after dosing, the placebo group maintained a response similar to their pre-dose level, while the 150 mg AB928 group only showed approximately 10% of the response seen pre-dose, indicating that the levels of AB928 remaining at 24 hours were still sufficient to inhibit approximately 90% of the NECA-mediated activation of A $_{2a}$ R.



In the second half of 2018, we initiated a clinical trial in cancer patients for AB928 in combination with AB122, our anti-PD-1 antibody. The dose-escalation portion of this trial is assessing the safety profile of increasing dose levels of AB928 when combined with a fixed dose of AB122 and will allow us to identify the recommended dose of AB928 + AB122 for future trials. Once we have determined the recommended dose of AB928 + AB122, we plan to initiate an expansion cohort to evaluate this combination in renal cell carcinoma, which we expect to initiate in the first half of 2019. This expansion cohort will initially enroll approximately 15 patients and will be expanded to up to 40 patients dependent on a predetermined minimum response rate.

In parallel with our regulatory application for our AB928 + AB122 combination trial, we initiated clinical trials in cancer patients for AB928 in combination with two different types of ICD-inducing chemotherapies (generally referred to here as chemotherapy), specifically platinum-based therapy and anthracycline-based therapy. Once the recommended dose is determined for AB928 in combination with a fixed dose of each chemotherapy partner, we plan to advance these combinations into selected expansion cohorts. The dose-escalation portion of our combination trials of AB928 + Doxil ® and AB928 + mFOLFOX began enrolling patients in 2018, and we currently expect the dose-expansion portion to begin enrolling patients in the second half of 2019. We are also initiating a clinical trial of AB928 in combination with carboplatin and pemetrexed with or without pembrolizumab, which we anticipate will begin enrolling patients in the dose-escalation portion in mid-2019. We have selected tumor types in which to evaluate these combinations based on considerations consistent with those outlined above, namely, tumor types that are associated with high expression of CD73, that are generally known to be accessible to T cell infiltration, and for which one of the chemotherapies of interest are already considered standard of care. For the expansion cohorts shown below, there already exists significant historical response data for anti-PD-1 therapy or ICD-inducing chemotherapy alone. We expect that this will enable us to better quantify the potential clinical benefits of our combination therapies in comparison to these standards of care.

The following schematic depict s the designs for the clinical trials described above.



TNBC: triple negative breast cancer; GE: gastroesophageal cancer; CRC: colorectal cancer; NSCLC: non-small cell lung cancer; RP2D: recommended Phase 2 dose; TKI: tyrosine kinase inhibitor; RCC: renal cell carcinoma.

An important component of our development program is the incorporation of a biomarker strategy to identify patients most likely to benefit from AB928. In our initial clinical trials of AB928 in patients, we are testing patients' tumors for CD73 expression and expect to use CD73 expression as a tool to select patients in future trials. We will also evaluate other tumor and blood markers designed to establish the extent of *in vivo* inhibition of the adenosine system, assess the effects of AB928 on the anti-tumor immune response, and identify additional biomarkers that are potentially predictive of response to AB928 and that could be used to screen patients in our future clinical trials.

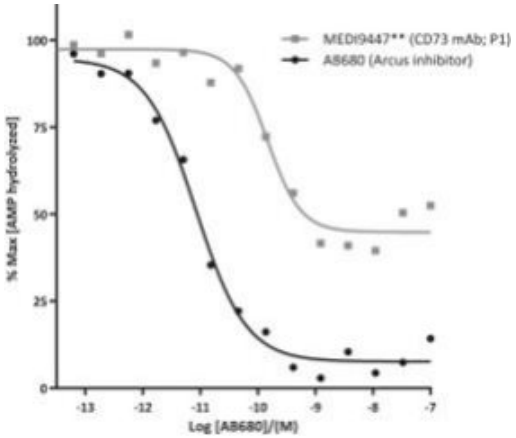
Our CD73 Inhibitor Program

Our next most advanced program in the adenosine pathway targets the CD73 enzyme, which plays a critical role in the last step of the process of extracellular ATP conversion into adenosine. CD73 inhibition should therefore be a highly effective approach to inhibiting the activation of adenosine-mediated immune suppression, as it could significantly suppress adenosine generation.

Optimization of our CD73 inhibitors was facilitated through a collaboration with Professor Norbert Sträter (University of Leipzig), a structural biologist who has solved the structure of multiple complexes of CD73 bound to our compounds. We have utilized this information in a structure-based drug design effort to create small-molecule inhibitors of CD73 with extraordinary potency in the picomolar range. These compounds include some with extremely long half-lives, such as our lead development candidate, AB680, which we believe could be dosed intravenously in the clinic at the same time that a patient receives anti-PD-1 therapy or chemotherapy. This compound, AB680, can also be dosed orally. We expect to complete preclinical studies (CMC and GLP toxicology studies) on the oral AB680 product candidate in 2019.

We believe AB680 is the first small-molecule CD73 inhibitor to enter clinical development. While there are several anti-CD73 antibodies in development, we believe that a small-molecule approach to CD73 inhibition could offer several advantages, including:

- *More complete inhibition of CD73 enzymatic activity.* As illustrated in the graph below, we have shown in our assays that our small-molecule CD73 inhibitor, AB680, inhibits CD73 more potently and effectively than one of the anti-CD73 antibodies in clinical development, MEDI9447. One explanation for this difference in potency is that our small-molecule CD73 inhibitors bind in the active site of the CD73 enzyme and they do so with an affinity about ten million times greater than the affinity of its substrate, AMP, for CD73. In contrast, many anti-CD73 antibodies were not designed to inhibit the enzymatic activity of CD73 but to instead induce internalization of CD73 from the cell surface and therefore will be less effective at inhibiting soluble forms of CD73. There are significant levels of soluble CD73 that have been shed from the cell surface. Our small-molecule inhibitors display comparable potency and effectiveness against soluble as well as membrane-bound forms of CD73, while at least some of the CD73 antibodies in development are unable to completely inhibit the enzymatic action of soluble CD73.



* Representative data from two separate experiments shown

** Prepared by Arcus based on Hay et al., OncoImmunology (2016) 5, e1208875; Patent Appl. US 2016/0129108

- *Deeper tumor penetration.* As small molecules, we expect that our CD73 inhibitors should be able to achieve better penetration of tumor tissue relative to the CD73 antibodies which are much larger molecules. We have shown, in tumor-bearing mice, that the concentrations of our inhibitors in the tumor tissue are approximately 15-20% of those in the blood, demonstrating their ability to permeate well beyond the tumor micro-vasculature. It is well accepted that monoclonal antibodies, because of their molecular size and properties, cannot diffuse further than a few microns from the blood vessel that delivers them to the tumor.
- *Potential for both intravenous and oral delivery.* We are developing both oral and injectable formulations of our CD73 inhibitors, which could provide flexibility on dosing regimens. We expect that AB680 dosed once every two or three weeks, on the same schedule as an anti-PD-1 antibody or a chemotherapeutic agent, would be very convenient for patients and also be very attractive commercially. An orally formulated AB680 would be highly convenient for patients not undergoing regular infusions.

Our Clinical Development Strategy for AB680

We initiated a clinical trial of AB680 in healthy volunteers during the second half of 2018. We currently plan to model the early development program for AB680 after our development strategy for AB928 and expect to initiate dose-escalation trials of AB680 in combination with AB122 and with chemotherapy by the second half of 2019. The selection of tumor types in which to evaluate the clinical effects of AB680 will be influenced by our analysis of settings (such as colorectal cancer and pancreatic cancer) in which we believe that the generation of adenosine by CD73 plays an important role in immunosuppression. It is possible that response rates and/or duration of response of a particular tumor type might be different for AB928 versus AB680 treatment.

Our Antibody Programs

In addition to our small-molecule programs, we are developing antibody drug candidates that are currently considered to be backbone therapy in immuno-oncology or that have the potential to be backbone therapy in the future, such as our in-licensed anti-PD-1 and anti-TIGIT antibodies. Our strategy is to create differentiated combination products by combining these antibodies with our internally discovered small-molecule product candidates. In addition, by having these antibodies in our portfolio, we can better control the combinations that we pursue, as well as potentially capture a greater share of the value of the combination products. As a result, we have established internal capabilities that allow us to evaluate and develop antibody drug candidates and will continue to explore opportunities to create or in-license antibodies that we believe will be critical to our intra-portfolio combination development strategy.

Our Anti-PD-1 Antibody, AB122

In 2017, we in-licensed our anti-PD-1 antibody, which we refer to as AB122, from WuXi Biologics. AB122 is a fully human IgG4 antibody that was generated by WuXi Biologics using the transgenic rat platform from Open Monoclonal Technology. The biochemical, biological and preclinical properties of AB122 have been shown by WuXi Biologics and us to be comparable to those of the marketed anti-PD-1 antibodies nivolumab and pembrolizumab. We are currently evaluating AB122 in cancer patients in a Phase 1 dose-escalation trial.

Our Clinical Development Strategy for AB122

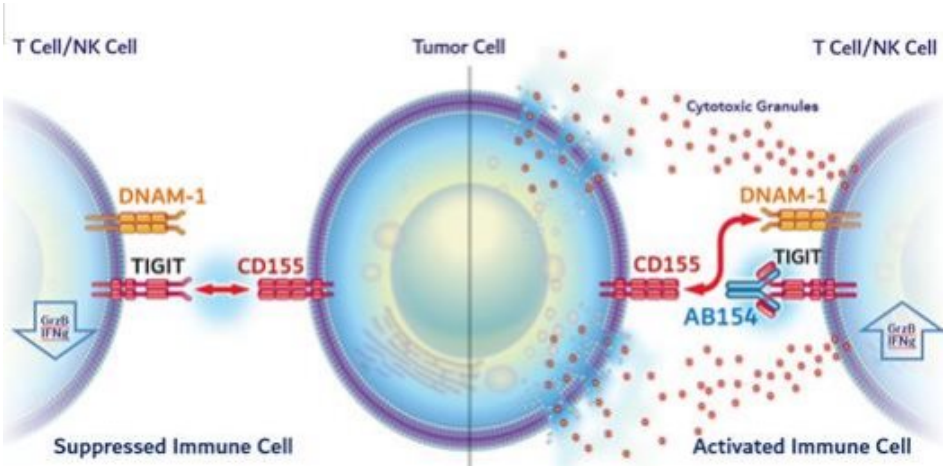
In 2017, we initiated dosing in Australia for our Phase 1 trial of AB122 in cancer patients. We decided to start our clinical testing of AB122 in Australia because we were able to proceed from regulatory filing to dosing of the first patient much more quickly than would have been the case in the United States. We also believe that we were able to enroll patients more quickly in Australia than in the United States, because there are more patients that have not received anti-PD-1 therapy in Australia. From this Phase 1 trial of AB122, we have identified 240 mg administered every two weeks as the dosing regimen to use in combination trials with AB928. To date, we have dosed 24 patients and AB122 has exhibited a pharmacokinetic profile similar to nivolumab. As discussed above under the section titled "—Our Clinical Development Strategy for AB928", this will be followed by various dose-expansion cohorts that will evaluate the combination in carefully chosen tumor types.

We are evaluating various strategies to demonstrate the clinical benefit of AB122 monotherapy, given its role as a cornerstone of our combination strategy. In mid-2019, we plan to initiate a dose expansion cohort which would evaluate AB122 as a single agent in approximately 30-40 cancer patients in a tumor type known to be responsive to anti-PD-1/PD-L1 therapy, such as non-small-cell lung cancer.

Our Anti-TIGIT Antibody, AB154

Our second antibody program targets TIGIT (T-cell immunoreceptor with Ig and ITIM domains), a unique immune checkpoint target, because its primary ligand, CD155, plays both inhibitory and stimulatory roles in regulating the activity of effector immune cells such as T and NK cells. TIGIT is an inhibitory receptor highly expressed on T cells displaying an exhausted phenotype, tumor-infiltrating T_{reg}, and NK cells. The ligands for TIGIT are expressed on a large number of cancer cells and on other immune cells such as dendritic cells, and their binding to TIGIT results in inhibition of immune cells.

In addition to TIGIT, CD155 binds, with lower affinity, to DNAM-1 (also known as CD226), a stimulatory receptor also expressed on T cells and NK cells. As a result, when anti-TIGIT antibodies bind to TIGIT, thereby blocking the TIGIT:CD155 interaction, they not only block an inhibitory signal on T cells and NK cells but also free up CD155 to bind to and activate DNAM-1, leading to increased activation of T cells and NK cells. The graphic below further illustrates the TIGIT:CD155 interaction and consequences of inhibiting TIGIT.



- TIGIT binds to CD155 (high affinity) and CD112 (low affinity)
- DNAM-1 competes, with lower affinity than TIGIT, for binding to CD155
- TIGIT binding to CD155 results in reduced function of effector immune cells
- CD155 binding to DNAM-1 results in activation of immune cells
- When an anti-TIGIT antibody binds to TIGIT, it frees up CD155 to bind to DNAM-1, resulting in activation of effector immune cells

Concurrent blockade of TIGIT and PD-1 has been shown to be more effective than PD-1 blockade alone in both *in vitro* and *in vivo* models. Importantly, high TIGIT expression at initial cancer diagnosis is associated with CD8+ T cell exhaustion and poor clinical outcomes.

AB154 is our humanized anti-TIGIT IgG1 monoclonal antibody engineered to lack FcgR binding and effector function (that is, it will not trigger antibody-dependent cellular cytotoxicity—ADCC—or complement-dependent cytotoxicity—CDC). We in-licensed AB154 in 2016. Since that time, we have completed cell line development and other chemistry, manufacturing and controls, or CMC, activities and preclinical safety assessment studies.

Development Status of AB154

In 2018, we began enrollment in a dose-escalation trial investigating AB154 as monotherapy and in combination with AB122 in cancer patients. We estimate that safety, PK/PD and initial clinical activity data will be available from the monotherapy dose-escalation portion of the trial in the second half of 2019; once the recommended Phase 2 dosing regimen (as monotherapy and in the combination) has been established, we plan to evaluate these therapies in selected tumor types, which will be based on results from our work to identify those tumor types with the highest expression levels of CD155 and TIGIT. Leading clinical settings at this time include the following types of cancer: head and neck, triple-negative breast and non-small cell lung cancer.

Our Early-Stage Drug Discovery Programs

We are actively working on two early-stage programs aimed at modulating various aspects of the anti-tumor immune response which we believe play an important role in many human cancers. We anticipate selecting a development product candidate from at least one of these new programs and initiating its CMC/preclinical development program during 2019.

In order to diversify and broaden the scope of our small-molecule drug discovery programs, we have strategically initiated drug discovery programs in two areas outside immuno-oncology. Firstly, we have initiated efforts against two cancer cell-intrinsic pathways that we believe are important drivers of growth and survival of certain types of cancer. We are also in the process of initiating drug discovery efforts against a biological pathway that we believe plays an important role in a variety of human inflammatory/auto-immune diseases. While these are still very early drug discovery efforts, we would anticipate that one of them will deliver a development product candidate in 2020 and that we will able to initiate CMC/preclinical development on such molecule during 2020.

Commercialization Plans

We intend to retain significant development and commercial rights to our product candidates and, if marketing approval is obtained, to commercialize our product candidates on our own, or potentially with a partner, in the United States and other regions. We currently have no sales, marketing or commercial product distribution capabilities and have no experience as a company commercializing products. We intend to build the necessary infrastructure and capabilities over time for the United States, and potentially other regions, following further advancement of our product candidates. Clinical data, the size of the addressable patient population, the size of the commercial infrastructure and manufacturing needs may all influence or alter our commercialization plans.

License Agreements

Abmuno Therapeutics LLC License Agreement

In 2016, we entered into a license agreement (the Abmuno Agreement) with Abmuno Therapeutics LLC (Abmuno) for a worldwide exclusive license to develop, use, manufacture, and commercialize products that include an anti-TIGIT antibody. We licensed AB154 under the Abmuno Agreement. Under the Abmuno Agreement, we have made upfront and milestone payments of $6.6 million as of December 31, 2018 and we may be required to make additional clinical, regulatory and commercialization milestone payments up to $101.8 million.

The Abmuno Agreement terminates on the latest of (i) the expiry of the last-to-expire Abmuno licensed patent that covers a product that contains an anti-TIGIT antibody, (ii) the date on which there is no longer an Abmuno licensed patent application that is still pending and has been pending for a certain period of time that covers a product that contains an anti-TIGIT antibody and (iii) 10 years from the date of first commercial sale.

WuXi Biologics (Cayman) Inc. License Agreement

In 2017, we entered into a license agreement (the WuXi Agreement) with WuXi Biologics (Cayman) Inc. (WuXi Biologics) for an exclusive license to develop, use, manufacture, and commercialize products that include an anti-PD-1 antibody throughout the world except for China and five other countries outside of the United States, Europe and Japan. We licensed AB122 under the WuXi Agreement. Under the WuXi Agreement, we have made upfront and milestone payments of $18.5 million as of December 31, 2018 and we may be required to make additional clinical and regulatory milestone payments, commercialization milestone payments up to $375.0 million, and royalty payments that range from high single-digits to low teens of net sales beginning on the first commercial sale and ending on the later of (i) ten (10) years following such first commercial sale and (ii) the expiry of all patents that may subsequently be issued or granted that cover the product in such country, hereafter referred to as the royalty term. We are also required to pay WuXi Biologics a percentage in the low double digits of certain sublicense income that we receive from our sublicensees in direct connection with our sublicensees' rights to use WuXi Biologics's patents, patent applications and know-how.

We are obligated to appoint WuXi Biologics as our exclusive manufacturer of such licensed products for a certain period of time subject to certain exceptions. Our sublicensees, however, may manufacture, at any time, certain portions of their requirements for such product subject to certain conditions. We made certain covenants not to commercialize any anti-PD-1 antibody licensed or obtained by us after the date of the license agreement with WuXi Biologics other than anti-PD-1 antibodies licensed from WuXi Biologics, subject to certain exceptions as set forth in the WuXi Agreement.

This agreement terminates, on a licensed product-by-licensed product and country-by-country basis, on expiration of the royalty term for such licensed product for the applicable country.

Taiho Pharmaceutical Co., Ltd. Option and License Agreement

In 2017, we entered into an option and license agreement (the Taiho Agreement) with Taiho Pharmaceutical Co., Ltd. (Taiho) pursuant to which Taiho will provide $35.0 million of non-refundable, non-creditable cash payments to us during the first three years of the agreement in exchange for an exclusive option, over a five-year period (the Option Period), to in-license the development and commercialization rights to clinical stage product candidates from our portfolio (each, an Arcus Program) for Japan and certain other territories in Asia (excluding China) (the Taiho Territory). We received $25.0 million in 2017 and we are due an additional $5.0 million of non-refundable and non-creditable payments in both 2018 and 2019. If we do not initiate IND-enabling studies for at least five Arcus Programs prior to the expiration of the Option Period, Taiho may elect to extend the Option Period, up to a maximum of seven years for the Option Period, subject to an extension fee. If Taiho elects to exercise any such options, the license described above will be granted under terms and conditions set forth in the agreement. Under such terms, Taiho is obligated to pay an option exercise payment for each option exercise of between $3.0 million to $15.0 million, with the amount dependent on the development stage of the applicable Arcus Program for which the option is exercised. In addition, Taiho is obligated to pay to us clinical, regulatory and commercialization milestones up to $275.0 million with respect to each program for which Taiho exercises the option and been granted the applicable license, as well as royalties ranging from high single digits to mid-teens, on net sales in Taiho's territories. Royalties will be payable on a licensed product-by-licensed product and country-by-country basis during the period of time commencing on the first commercial sale of a licensed product in a country and ending upon the later of: (i) ten (10) years from the date of first commercial sale of such licensed product in such country; and (ii) expiration of the last-to-expire valid claim of our patents covering the manufacture, use or sale or exploitation of such licensed product in such country.

In July 2018, Taiho exercised its option to our adenosine receptor antagonist program for a fee of $3.0 million. Upon this exercise, Taiho now has the sole responsibility for the development and commercialization of licensed products from within the program in the Taiho Territory.

This agreement will remain in effect until (i) expiration of the last option exercise period if Taiho has not exercised any of its options or (ii) if Taiho has exercised any of its options, expiry of all royalty terms for the licensed products.

Manufacturing and Supply

We do not own or operate, and currently have no plans to establish, any manufacturing facilities. We rely, and expect to continue to rely, on third parties for the manufacture of our product candidates for preclinical and clinical testing, as well as for commercial manufacture if any of our product candidates obtain marketing approval. We also rely, and expect to continue to rely, on third parties to package, label, store and distribute our investigational product candidates, as well as for our commercial products if marketing approval is obtained. We believe that this strategy allows us to maintain a more efficient infrastructure by eliminating the need for us to invest in our own manufacturing facilities, equipment and personnel while also enabling us to focus our expertise and resources on the development of our product candidates.

To date, we have obtained active pharmaceutical ingredients (API) and drug product for our product candidates from single-source third party contract manufacturers. We are in the process of developing our supply chain for each of our product candidates and intend to put in place framework agreements under which third-party contract manufacturers will generally provide us with necessary quantities of API and drug product on a project-by-project basis based on our development needs. With respect to AB122, we agreed, as part of our license agreement with WuXi Biologics, that WuXi Biologics would be our exclusive manufacturer of AB122 with respect to clinical and commercial supplies until a certain number of years after marketing approval for AB122, subject to certain exceptions.

As we advance our product candidates through development, we will consider our lack of redundant supply for the API and drug product for each of our product candidates to protect against any potential supply disruptions.

We generally expect to rely on third parties for the manufacture of any companion diagnostics we may develop.

Competition

The pharmaceutical and biotechnology industries are characterized by rapidly advancing technologies, intense competition and a strong emphasis on proprietary products. While we believe that our technology, development experience and scientific knowledge provide us with competitive advantages, we face potential competition from many different sources, including large pharmaceutical and biotechnology companies, academic institutions, government agencies and other public and private research organizations that conduct research, seek patent protection and establish collaborative arrangements for the research, development, manufacturing and commercialization of cancer immunotherapies. Any product candidates that we successfully develop and commercialize will compete with new immunotherapies that may become available in the future.

We compete in the segments of the pharmaceutical, biotechnology and other related markets that develop immuno-oncology treatments. There are many other companies that have commercialized and/or are developing immuno-oncology treatments for cancer including large pharmaceutical and biotechnology companies, such as AstraZeneca/MedImmune, Bristol-Myers Squibb, Merck, Novartis, Pfizer and Roche/Genentech.

For our dual adenosine receptor antagonist, AB928, we are aware of several other clinical-stage selective adenosine $A_{2a}R$ antagonists being developed by AstraZeneca/MedImmune, Corvus, and Novartis and a clinical-stage selective adenosine $A_{2b}R$ antagonist being developed by Palobiofarma. To our knowledge, there are no adenosine receptor antagonists approved for the treatment of cancer and the most advanced such adenosine receptor antagonists are in Phase 1/2 clinical trials.

For our small molecule CD73 inhibitor, AB680, we are aware of several pharmaceutical companies developing antibodies against this target, including AstraZeneca/MedImmune, Bristol-Myers Squibb, Corvus and Novartis in collaboration with Surface Oncology, all of whom have advanced their CD73 antibodies into clinical development. Other pharmaceutical companies, such as Calithera and Peloton Therapeutics, have small-molecule programs against this target. To our knowledge, AB680 is the only small molecule CD73 inhibitor in clinical development.

For our anti-PD-1 antibody, AB122, multiple large pharmaceutical companies have already received regulatory approvals for their anti-PD-1/PD-L1 antibodies, including AstraZeneca, Bristol-Myers Squibb, Merck, Pfizer in partnership with Merck KGaA, Regeneron in partnership with Sanofi Genzyme and Roche/Genentech. There are also many other anti-PD-1 and anti-PD-L1 antibodies in clinical development.

For our anti-TIGIT antibody, AB154, we are aware of several pharmaceutical companies developing antibodies against this target including Astellas, Bristol-Myers Squibb, Compugen, Genentech, iTEOS, Merck and OncoMed. To our knowledge, there are no approved anti-TIGIT antibodies and the most advanced antibodies are in Phase 1/2 clinical trials.

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 drugs than we do. Mergers and acquisitions in the pharmaceutical, biotechnology and diagnostic 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 enrolling subjects for our clinical trials, as well as in acquiring technologies complementary to, or necessary for, our programs.

We could see a reduction or elimination of our commercial opportunity if our competitors develop and commercialize products that are safer, more effective, have fewer or less severe side effects, are more convenient or are less expensive than any products that we or our collaborators may develop. Our competitors also may obtain FDA or foreign regulatory approval for their products more rapidly than we may obtain approval for ours, which could result in our competitors establishing a strong market position before we or our collaborators are able to enter the market. The key competitive factors affecting the success of all of our product candidates, if approved, are likely to be their efficacy, safety, convenience, price, the effectiveness of companion diagnostics (if required), the level of biosimilar or generic competition and the availability of reimbursement from government and other third-party payors.

Intellectual Property

Our commercial success depends in large part on our ability to obtain and maintain patent protection in the United States and other countries for our product candidates, to operate without infringing valid and enforceable patents and proprietary rights of others, and to prevent others from infringing on our proprietary or intellectual property rights. We seek to protect our proprietary position by filing, in the United States and other foreign jurisdictions, patent applications intended to cover the composition of matter of our product candidates, their methods of use, and related discoveries, technologies, inventions and improvements that may be commercially important to our business. We may also rely on trade secrets to protect aspects of our business that are not amenable to, or that we do not consider appropriate for, patent protection. We also intend to take advantage of regulatory protection afforded through data exclusivity, market exclusivity and patent term extensions where available.

We do not yet own or license any issued patents relating to our product candidates. As of February 1, 2019, we own or have in-licensed 12 pending U.S. patent applications, 5 pending Patent Cooperation Treaty (PCT) patent applications, and 96 pending foreign patent applications. A PCT patent application is an international patent application that allows an applicant to simultaneously file in more than 150 contracting states via a single patent application. The PCT application can be converted into a “national phase” application in any such contracting state, at which point substantive examination will be performed by the patent office in the jurisdiction (*i.e.* country or region) in which the national phase application has been filed. As of February 1, 2019, with respect to our adenosine receptor antagonist program, we own 4 U.S. patent applications, 3 PCT patent applications and 7 foreign patent applications directed to compositions of matter and methods of use. As of February 1, 2019, with respect to our CD73 inhibitor program, we own 4 U.S. patent applications, 2 PCT patent applications and 29 foreign patent applications directed to compositions of matter and methods of use. As of February 1, 2019, with respect to our anti-PD-1 antibody program, we in-license 23 foreign patent applications and we own 1 U.S. patent application directed to compositions of matter and methods of use. As of February 1, 2019, with respect to our anti-TIGIT antibody program, we in-license 1 U.S. patent application and 25 foreign patent applications directed to compositions of matter and methods of use. The term of any patents that may issue will vary in accordance with the laws of each jurisdiction, but is typically 20 years from the earliest effective filing date. Any patents that may issue from our company-owned or licensed pending applications are projected to expire between 2035 and 2039, absent any patent term adjustments or extensions.

The patent positions for biotechnology and pharmaceutical companies like us are generally uncertain and can involve complex legal, scientific and factual issues. Changes in either the patent laws or their interpretation in the United States and other countries may diminish our ability to protect our product candidates and enforce the patent rights that we own or license, and could affect the value of such intellectual property. With respect to both company-owned and licensed intellectual property, we cannot guarantee that the patent applications we are currently pursuing or may file in the future will issue as patents in any particular jurisdiction or whether the claims of any issued patents will provide sufficient proprietary protection from competitors. Our competitors may independently develop similar product candidates or technologies that are outside the scope of the rights granted under any issued patents that we own or exclusively in-license. We cannot be sure that any patents that may be granted to us in the future will be commercially useful in protecting our products or their methods of use or manufacture. Moreover, even issued patents do not guarantee us the right to commercialize our products. For example, third parties may have blocking patents that could be used to prevent us from commercializing or manufacturing our product candidates.

Because of the extensive time required for development, testing and regulatory review of a product candidate, it is possible that, before a product can be commercialized, any patent protection for such product may expire or remain in force for only a short period following commercialization, thereby reducing the commercial advantage the patent provides. In the United States, the term of a patent covering an FDA-approved product may, in certain cases, be eligible for a patent term extension under the Hatch-Waxman Act as compensation for the loss of patent term during the FDA regulatory review process. The period of extension may be up to five years, but cannot extend the remaining term of a patent beyond a total of 14 years from the date of product approval. Only one patent among those eligible for an extension and only those claims covering the approved product, a method for using it or a method for manufacturing it may be extended. Similar provisions are available in Europe and in certain other jurisdictions to extend the term of a patent that covers an approved product. While we intend to seek patent term extensions in any jurisdictions where they are available, there is no guarantee that the applicable authorities, including the FDA, will agree with our assessment of whether such extensions should be granted, and even if granted, the length of such extensions.

Government Regulation

Government Regulation and Product Approval

Government authorities in the United States, at the federal, state and local level, and in other countries and jurisdictions, including the European Union, extensively regulate, among other things, the research, development, testing, manufacture, quality control, approval, packaging, storage, recordkeeping, labeling, advertising, promotion, distribution, marketing, post-approval monitoring and reporting, and import and export of therapeutic products. The processes for obtaining regulatory approvals in the United States and in foreign countries and jurisdictions, along with subsequent compliance with applicable statutes and regulations and other regulatory authorities, require the expenditure of substantial time and financial resources.

FDA Approval Process

In the United States, the Food and Drug Administration (FDA) regulates drugs and biological products under the Federal Food, Drug, and Cosmetic Act (FDCA), the Public Health Service Act (PHSA), and implementing regulations. These laws and other federal and state statutes and regulations, govern, among other things, the research, development, testing, manufacture, storage, recordkeeping, approval, labeling, promotion and marketing, distribution, post-approval monitoring and reporting, sampling, and import and export of therapeutic products. The process of obtaining regulatory approvals and the subsequent compliance with applicable federal, state, local and foreign statutes and regulations require the expenditure of substantial time and financial resources. Failure to comply with applicable U.S. requirements may subject a company to a variety of administrative or judicial sanctions, such as clinical hold, FDA refusal to approve pending regulatory applications, warning or untitled letters, product recalls, product seizures, total or partial suspension of production or distribution, injunctions, fines, civil penalties, and criminal prosecution.

The process required by the FDA before a drug or biological product may be marketed in the United States generally includes the following:

- Completion of preclinical laboratory tests, animal studies and formulation studies according to Good Laboratory Practices (GLP) or other applicable regulations;
- Submission to the FDA of an investigational new drug application (IND), which must become effective before human clinical trials may begin in the United States;
- Performance of adequate and well-controlled human clinical trials according to Good Clinical Practices (GCP), to establish the safety and efficacy of the product candidate for its intended use;
- Submissions to the FDA of a New Drug Application (NDA) or Biological Licensing Application (BLA) for a new product.
- Satisfactory completion of an FDA inspection of the facility or facilities where the product candidate is manufactured to assess compliance with the FDA's current good manufacturing practices (cGMP), to assure that the facilities, methods and controls are adequate to preserve the therapeutic product candidate's identify, strength, quality, purity, and potency;
- Potential FDA audit of the preclinical and clinical trial sites that generated the data in support of the NDA/BLA; and
- FDA review and approval of the NDA/BLA.

Satisfaction of FDA pre-market approval requirements typically takes many years and the actual time required may vary substantially based upon the type, complexity, and novelty of the product candidate or disease. A clinical hold may occur at any time during the life of an IND and may affect one or more specific trials or all trials conducted under the IND.

Preclinical tests include laboratory evaluation of product candidate's chemistry, formulation, and toxicity, as well as animal trials to assess the characteristics and potential safety and efficacy of the product candidate. The conduct of the preclinical tests must comply with federal regulations and requirements, including GLP. The results of preclinical testing are submitted to the FDA as part of an IND along with other information, including information about product candidate's chemistry, manufacturing and controls, and a proposed clinical trial protocol. Long term preclinical tests, such as animal tests of reproductive toxicity and carcinogenicity, may continue after the IND is submitted. A 30-day waiting period after the submission of each IND is required prior to the commencement of clinical testing in humans. If the FDA has neither commented on nor questioned the IND within this 30-day period, the clinical trial proposed in the IND may begin. Clinical trials involve the administration of the investigational product to healthy volunteers or subjects under the supervision of a qualified investigator. Clinical trials must be conducted: (i) in compliance with federal regulations; (ii) in compliance with GCP, an international standard meant to protect the rights and health of subjects and to define the roles of clinical trial sponsors, administrators, and monitors; as well as (iii) under protocols detailing the objectives of the trial, the parameters to be used in monitoring safety, and the effectiveness criteria to be evaluated. Each protocol involving testing on U.S. subjects and subsequent protocol amendments must be submitted to the FDA as part of the IND.

The FDA may order the temporary or permanent discontinuation of a clinical trial at any time, or impose other sanctions if it believes that the clinical trial either is not being conducted in accordance with FDA requirements or presents an unacceptable risk to the clinical trial subjects. The trial protocol and informed consent information for subjects in clinical trials must also be submitted to an institutional review board (IRB) for approval. An IRB may also require the clinical trial at the site to be halted, either temporarily or permanently, for failure to comply with the IRB's requirements, or may impose other conditions. The study sponsor may also suspend a clinical trial at any time on various grounds, including a determination that the subjects are being exposed to an unacceptable health risk.

Clinical trials to support NDAs/BLAs for marketing approval are typically conducted in three sequential phases, but the phases may overlap. In Phase 1, the initial introduction of the product candidate usually into healthy human subjects, the product candidate is tested to assess metabolism, pharmacokinetics, pharmacological actions, side effects associated with increasing doses, and, if possible, early evidence on effectiveness. Phase 2 usually involves trials in a limited patient population to determine the effectiveness of the product candidate for a particular indication, dosage tolerance, and optimal dosage, and to identify common adverse effects and safety risks. If a product candidate demonstrates evidence of effectiveness and an acceptable safety profile in Phase 2 evaluations, Phase 3 trials are undertaken to obtain additional information about clinical efficacy and safety in a larger number of subjects, typically at geographically dispersed clinical trial sites, to permit the FDA to evaluate the overall benefit risk relationship of the product candidate and to provide adequate information for the labeling of the product candidate. In most cases, the FDA requires two adequate and well-controlled Phase 3 clinical trials to demonstrate the efficacy of the product candidate. A single Phase 3 trial may be sufficient in certain circumstances.

Concurrent with clinical trials, sponsors usually complete additional animal safety studies and also develop additional information about the chemistry and physical characteristics of the product candidate and finalize a process for manufacturing commercial quantities of the product candidate in accordance with cGMP requirements. The manufacturing process must be capable of consistently producing quality batches of the product candidate and the manufacturer must develop methods for testing the quality, purity and potency of the product candidate. 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 proposed shelf-life. After completion of the required clinical testing, an NDA, for a drug product candidate, or a BLA, for a biological product candidate, is prepared and submitted to the FDA. FDA approval of the NDA or BLA is required before marketing of the product may begin in the United States. The NDA or BLA must include the results of all preclinical, clinical, and other testing and a compilation of data relating to the product candidate's pharmacology, chemistry, manufacture, and controls. The cost of preparing and submitting an NDA or BLA is substantial. The submission of most NDAs and BLAs is additionally subject to a substantial application user fee, and the applicant under an approved NDA or BLA is also subject to program user fees. These fees are typically increased annually.

The FDA has 60 days from its receipt of an NDA or BLA to determine whether the application will be accepted for filing based on the agency's threshold determination that it is sufficiently complete to permit substantive review. Combination products are typically marketed under an application type associated with the constituent part that provides the primary mode of action (PMOA) for the combination product (i.e., an NDA if it has a drug PMOA, a BLA if it has a biological product PMOA. A single marketing application is generally sufficient for a combination product. In some cases, however, a sponsor may wish to submit separate marketing applications for different constituent parts of a combination product, and the FDA may consider this permissible. The FDA may refuse to file any NDA or BLA that it deems incomplete or not properly reviewable at the time of submission, and may request additional information. In this event, the NDA or BLA must be resubmitted with the additional information and the resubmitted application also is subject to review before the FDA accepts it for filing. Once the submission is accepted for filing, the FDA begins an in-depth review. The FDA has agreed to certain performance goals in the review of NDAs and BLAs. Most such applications for standard review product candidates are reviewed within ten months of the date the FDA files the NDA or BLA; most applications for priority review product candidates are reviewed within six months of the date the FDA files the NDA or BLA. Priority review can be applied to a product candidate that the FDA determines has the potential to treat a serious or life-threatening condition and, if approved, would be a significant improvement in safety or effectiveness compared to available therapies. The review process for both standard and priority review may be extended by the FDA for three additional months to consider certain late-submitted information, or information intended to clarify information already provided in the submission.

Among other things, the FDA reviews an NDA to determine whether the product is safe and effective for its intended use, a BLA to determine whether the product is safe, pure, and potent, and in each case, whether the product candidate is being manufactured in accordance with cGMP. The FDA may also refer applications for novel product candidates, or product candidates that present difficult questions of safety or efficacy, to an advisory committee—typically a panel that includes clinicians and other experts—for review, evaluation, and a recommendation as to whether the application should be approved. The FDA is not bound by the recommendation of an advisory committee, but it generally follows such recommendations.

Before approving an NDA or BLA, the FDA will typically inspect one or more clinical sites to assure compliance with GCP. Additionally, the FDA will inspect the facility or the facilities at which the product candidate is manufactured. The FDA will not approve the product candidate 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. To assure GCP and cGMP compliance, an applicant must incur significant expenditures of time, money and effort in the areas of training, record keeping, production and quality control.

Notwithstanding the submission of relevant data and information, the FDA may ultimately decide that the NDA or BLA does not satisfy the criteria for approval and deny approval. Data obtained from clinical trials are not always conclusive. The FDA may disagree with our trial design or interpret data from preclinical studies and clinical trials differently than we interpret the same data. If the agency decides not to approve the NDA or BLA in its present form, the FDA will issue a complete response letter that describes all of the specific deficiencies in the application identified by the FDA. The deficiencies identified may be minor, for example, requiring labeling changes, or major, for example, requiring additional clinical trials. If a complete response letter is issued, the applicant may either resubmit the NDA or BLA, addressing the deficiencies identified in the letter, or withdraw the application. If, or when, those deficiencies have been addressed to the FDA's satisfaction in a resubmission of the NDA or BLA, the FDA will issue an approval letter. The FDA has committed to reviewing such resubmissions in two or six months depending on the type of information included. An approval letter authorizes commercial marketing of the drug or biological product in the United States with specific prescribing information for specific indications.

Even if a product candidate receives regulatory approval, the approval may be significantly limited to specific indications and dosages or the indications for use may otherwise be limited, which could restrict the commercial value of the product. Further, the FDA may require that certain contraindications, warnings or precautions be included in the product labeling. The FDA may impose restrictions and conditions on product distribution, prescribing, or dispensing in the form of a risk evaluation and mitigation strategy (REMS), or otherwise limit the scope of any approval. REMS can include medication guides, communication plans for healthcare professionals, and elements to assure safe use (ETASU). ETASU can include, but are not limited to, special training or certification for prescribing or dispensing, dispensing only under certain circumstances, special monitoring, and the use of patient registries. The requirement for a REMS can materially affect the potential market and profitability of the product. In addition, the FDA may require post marketing clinical trials, sometimes referred to as "Phase 4" clinical trials, designed to further assess a product's safety and effectiveness, and testing and surveillance programs to monitor the safety of approved products that have been commercialized.

Foreign Clinical Trials to Support an IND, NDA, or BLA

The FDA will accept as support for an IND, NDA, or BLA a well-designed, well-conducted, non-IND foreign clinical trial if it was conducted in accordance with GCP and the FDA is able to validate the data from the trial through an on-site inspection, if necessary. A sponsor or applicant who wishes to rely on a non-IND foreign clinical trial to support an IND must submit the following supporting information to the FDA to demonstrate that the trial conformed to GCP:

- the investigator's qualifications;
- a description of the research facilities;
- a detailed summary of the protocol and trial results and, if requested, case records or additional background data;
- a description of the drug substance and drug product, including the components, formulation, specifications, and, if available, the bioavailability of the product candidate;
- information showing that the trial is adequate and well controlled;
- the name and address of the independent ethics committee that reviewed the trial and a statement that the independent ethics committee meets the required definition;

- a summary of the independent ethics committee's decision to approve or modify and approve the trial, or to provide a favorable opinion;
- a description of how informed consent was obtained;
- a description of what incentives, if any, were provided to subjects to participate;
- a description of how the sponsor monitored the trial and ensured that the trial was consistent with the protocol;
- a description of how investigators were trained to comply with GCP and to conduct the trial in accordance with the trial protocol; and
- a statement on whether written commitments by investigators to comply with GCP and the protocol were obtained.

Regulatory applications based solely on foreign clinical data meeting these criteria may be approved if the foreign data are applicable to the U.S. population and U.S. medical practice, the trials have been performed by clinical investigators of recognized competence, and the data may be considered valid without the need for an on-site inspection by FDA or, if FDA considers such an inspection to be necessary, FDA is able to validate the data through an on-site inspection or other appropriate means. Failure of an application to meet any of these criteria may result in the application not being approvable based on the foreign data alone.

Expedited Development and Review Programs

The FDA has various programs, including Fast Track, priority review, accelerated approval and breakthrough therapy, which are intended to expedite or simplify the process for reviewing product candidates, or provide for the approval of a product candidate on the basis of a surrogate endpoint. Even if a product candidate qualifies for one or more of these programs, the FDA may later decide that the product candidate no longer meets the conditions for qualification or that the time period for FDA review or approval will be lengthened. Generally, product candidates that are eligible for these programs are those for serious or life-threatening conditions, those with the potential to address unmet medical needs and those that offer meaningful benefits over existing treatments. For example, Fast Track is a process designed to facilitate the development and expedite the review of product candidates to treat serious or life-threatening diseases or conditions and fill unmet medical needs. Priority review is designed to give a product candidate that treats a serious condition and, if approved, would provide a significant improvement in safety or effectiveness, an initial review within eight months as compared to a standard review time of twelve months.

Although Fast Track and priority review do not affect the standards for approval, the FDA will attempt to facilitate early and frequent meetings with a sponsor of a Fast Track designated product candidate and expedite review of the application for a product candidate designated for priority review. Accelerated approval provides for an earlier approval for a new product candidate that meets the following criteria: is intended to treat a serious or life-threatening disease or condition, generally provides a meaningful advantage over available therapies and demonstrates 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 (IMM) that is reasonably likely to predict an effect on IMM or other clinical benefit. A surrogate endpoint is a laboratory measurement or physical sign used as an indirect or substitute measurement representing a clinically meaningful outcome. As a condition of approval, the FDA may require that a sponsor of a product candidate receiving accelerated approval perform post-marketing clinical trials to verify and describe the predicted effect on irreversible morbidity or mortality or other clinical endpoint, and the product may be subject to accelerated withdrawal procedures.

In addition to the Fast Track, accelerated approval and priority review programs discussed above, the FDA also provides Breakthrough Therapy designation. A sponsor may seek FDA designation of a product candidate as a "breakthrough therapy" if the product candidate is intended, alone or in combination with one or more other therapeutics, 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.

Patent Term Restoration and Marketing Exclusivity

After approval, owners of relevant drug or biological product patents may apply for up to a five year patent extension under the Drug Price Competition and Patent Term Restoration Act of 1984, referred to as the Hatch-Waxman Act. The allowable patent term extension is calculated as half of the product's testing phase—the time between IND and NDA or BLA submission—and all of the review phase—the time between NDA or BLA submission and approval, up to a maximum of five years. The time can be shortened if the FDA determines that the applicant did not pursue approval with due diligence. The total patent term after the extension may not exceed 14 years.

For patents that might expire during the application phase, the patent owner may request an interim patent extension. An interim patent extension increases the patent term by one year and may be renewed up to four times. For each interim patent extension granted, the post-approval patent extension is reduced by one year. The director of the U.S. Patent and Trademark Office must determine that approval of the product candidate covered by the patent for which a patent extension is being sought is likely. Interim patent extensions are not available for a product candidate for which an NDA or BLA has not been submitted.

Market exclusivity provisions under the FDCA also can delay the submission or the approval of certain applications. The FDCA provides a five-year period of non-patent marketing exclusivity within the U.S. to the first applicant to gain approval of an NDA for a new chemical entity. A product candidate is a new chemical entity if the FDA has not previously approved any other new product candidate containing the same active moiety, which is the molecule or ion responsible for the action of the product candidate substance. During the exclusivity period, the FDA may not accept for review an abbreviated new drug application (ANDA) or a 505(b)(2) NDA submitted by another company for another version of such product candidate where the applicant does not own or have a legal right of reference to all the data required for approval. However, an application may be submitted after four years if it contains a certification of patent invalidity or non-infringement. The FDCA also provides three years of marketing exclusivity for an NDA, 505(b)(2) NDA or supplement to an approved NDA if new clinical investigations, other than bioavailability studies, that were conducted or sponsored by the applicant are deemed by the FDA to be essential to the approval of the application, for example, for new indications, dosages or strengths of an existing product candidate. This three-year exclusivity covers only the conditions associated with the new clinical investigations and does not prohibit the FDA from approving ANDAs for product candidates containing the original active agent. Five-year and three-year exclusivity will not delay the submission or approval of a full NDA. However, an applicant submitting a full NDA would be required to conduct or obtain a right of reference to all of the preclinical studies and adequate and well-controlled clinical trials necessary to demonstrate safety and effectiveness.

Biosimilars

The Biologics Price Competition and Innovation Act of 2009 (BPCIA) created an abbreviated approval pathway for biological product candidates shown to be highly similar to or interchangeable with an FDA licensed reference biological product. Biosimilarity sufficient to reference a prior FDA-approved product requires that there be no differences in conditions of use, route of administration, dosage form, and strength, and no clinically meaningful differences between the biological product candidate and the reference product in terms of safety, purity, and potency. Biosimilarity must be shown through analytical trials, animal trials, and a clinical trial or trials, unless the Secretary of Health and Human Services waives a required element. A biosimilar product candidate may be deemed interchangeable with a prior approved product if it meets the higher hurdle of demonstrating that it can be expected to produce the same clinical results as the reference product and, for products administered multiple times, the biologic and the reference biologic may be 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 process by which such products are manufactured, pose significant hurdles to implementation, which is still being evaluated by the FDA.

A reference biologic is granted 12 years of exclusivity from the time of first licensure of the reference product, and no application for a biosimilar can be submitted for four years from the date of licensure of the reference product. The first biologic product candidate submitted under the abbreviated approval pathway that is determined to be interchangeable with the reference product has exclusivity against a finding of interchangeability for other biologics for the same condition of use for the lesser of (i) one year after first commercial marketing of the first interchangeable biosimilar, (ii) 18 months after the first interchangeable biosimilar is approved if there is no patent challenge, (iii) 18 months after resolution of a lawsuit over the patents of the reference biologic in favor of the first interchangeable biosimilar applicant, or (iv) 42 months after the first interchangeable biosimilar's application has been approved if a patent lawsuit is ongoing within the 42-month period.

Post-approval Requirements

Once an approval is granted, the FDA may withdraw the approval if compliance with regulatory requirements is not maintained or if problems occur after the product reaches the market. Later discovery of previously unknown problems with a product may result in restrictions on the product or even complete withdrawal of the product from the market. After approval, some types of changes to the approved product, such as adding new indications, manufacturing changes and additional labeling claims, are subject to further FDA review and approval. In addition, the FDA may under some circumstances require testing and surveillance programs to monitor the effect of approved products that have been commercialized, and the FDA under some circumstances has the power to prevent or limit further marketing of a product based on the results of these post-marketing programs. Any product manufactured or distributed by us or our collaborators pursuant to FDA approvals are subject to continuing regulation by the FDA, including, among other things:

- record-keeping requirements;
- reporting of adverse experiences associated with the product;
- providing the FDA with updated safety and efficacy information;
- therapeutic sampling and distribution requirements;
- notifying the FDA and gaining its approval of specified manufacturing or labeling changes;
- registration and listing requirements; and
- complying with FDA promotion and advertising requirements, which include, among other things, standards for direct-to-consumer advertising, restrictions on promoting products for uses or in patient populations that are not described in the product's approved labeling, limitations on industry-sponsored scientific and educational activities and requirements for promotional activities involving the internet.

Manufacturers, their subcontractors, and other entities involved in the manufacture and distribution of approved drug and biological products are required to register their establishments with the FDA and certain state agencies and are subject to periodic unannounced inspections by the FDA and some state agencies for compliance with cGMP, including data integrity requirements, and other laws. The FDA periodically inspects manufacturing facilities to assess compliance with ongoing regulatory requirements, including cGMP, which impose extensive procedural, substantive and record-keeping requirements upon us and third-party manufacturers engaged by us if our products are approved. In addition, changes to the manufacturing process are strictly regulated, and, depending on the significance of the change, may require FDA approval before being implemented. FDA regulations would also require investigation and correction of any deviations from cGMP and impose reporting and documentation requirements upon us and our third-party manufacturers. 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. Failure to comply with the statutory and regulatory requirements can subject a manufacturer to possible legal or regulatory actions, such as warning letters, suspension of manufacturing, seizures of products, injunctive actions or other civil penalties. We cannot be certain we or our present or future third-party manufacturers or suppliers will be able to comply with the cGMP regulations and other ongoing FDA regulatory requirements. If we or our present or future third-party manufacturers or suppliers are not able to comply with these requirements, the FDA may halt our clinical trials or require us to recall a product from distribution.

In addition, therapeutic manufacturers in the United States must comply with applicable provisions of the Drug Supply Chain Security Act and provide and receive product tracing information, maintain appropriate licenses, ensure they only work with other properly licensed entities, and have procedures in place to identify and properly handle suspect and illegitimate product.

Additional Controls for Biological Products

To help reduce the increased risk of the introduction of adventitious agents, the PHSA emphasizes the importance of manufacturing controls for products whose attributes cannot be precisely defined. The PHSA also provides authority to the FDA to immediately suspend licenses in situations where there exists a danger to public health, to prepare or procure products in the event of shortages and critical public health needs, and to authorize the creation and enforcement of regulations to prevent the introduction or spread of communicable diseases in the United States and between states.

After a BLA is approved, the biological product may also be subject to official lot release as a condition of approval. As part of the manufacturing process, the manufacturer is required to perform certain tests on each lot of the product before it is released for distribution. If the product is subject to official release by the FDA, the manufacturer submits samples of each lot of product to the FDA together with a release protocol showing a summary of the history of manufacture of the lot and the results of all of the manufacturer's tests performed on the lot. The FDA may also perform certain confirmatory tests on lots of some products, such as viral vaccines, before releasing the lots for distribution by the manufacturer.

In addition, the FDA conducts laboratory research related to the regulatory standards on the safety, purity, potency, and effectiveness of biological products. As with drugs, after approval of biological products, manufacturers must address any safety issues that arise, are subject to recalls or a halt in manufacturing, and are subject to periodic inspection after approval.

FDA Regulation of Companion Diagnostics

If use of an *in vitro* diagnostic is essential to safe and effective use of a drug or biologic product, then the FDA generally will require approval or clearance of the diagnostic, known as a companion diagnostic and regulated by FDA as a medical device, at the same time that the FDA approves the product candidate. The review of an *in vitro* companion diagnostic in conjunction with the review of a product candidate involves coordination of review between internal organizations within FDA. Most companion diagnostics require approval of a premarket approval application (PMA). The PMA process, including the gathering of clinical and preclinical data and the submission to and review by the FDA, can take several years or longer. It involves a rigorous premarket review during which the applicant must prepare and provide the FDA with reasonable assurance of the device's safety and effectiveness and information about the device and its components regarding, among other things, device design, manufacturing and labeling. PMAs are subject to a substantial application fee. In addition, PMAs for certain devices must generally include the results from extensive preclinical and adequate and well-controlled clinical trials to establish the safety and effectiveness of the device for each indication for which FDA approval is sought. In particular, for a diagnostic, the applicant must demonstrate that the diagnostic produces reproducible results when the same sample is tested multiple times by multiple users at multiple laboratories. As part of the PMA review, the FDA will typically inspect the manufacturer's facilities for compliance with the Quality System Regulation (QSR) which imposes elaborate testing, control, documentation and other quality assurance requirements.

PMA approval is not guaranteed, and the FDA may ultimately respond to a PMA submission with a not approvable determination based on deficiencies in the application and require additional clinical trial or other data that may be expensive and time-consuming to generate and that can substantially delay approval. If the FDA's evaluation of the PMA application is favorable, the FDA typically issues an approvable letter requiring the applicant's agreement to specific conditions, such as changes in labeling, or specific additional information, such as submission of final labeling, in order to secure final approval of the PMA. If the FDA concludes that the applicable criteria have been met, the FDA will issue a PMA for the approved indications, which can be more limited than those originally sought by the applicant. The PMA can include post-approval conditions that the FDA believes necessary to ensure the safety and effectiveness of the device, including, among other things, restrictions on labeling, promotion, sale and distribution.

After a device is placed on the market following appropriate approval or clearance from the FDA, it remains subject to significant regulatory requirements. Medical devices may be marketed only for the uses and indications for which they are cleared or approved. Device manufacturers must also establish registration and device listings with the FDA. A medical device manufacturer's manufacturing processes and those of its suppliers are required to comply with the applicable portions of the QSR, which cover the methods and documentation of the design, testing, production, processes, controls, quality assurance, labeling, packaging and shipping of medical devices. Domestic facility records and manufacturing processes are subject to periodic unscheduled inspections by the FDA. The FDA also may inspect foreign facilities that export products to the United States.

New Legislation and Regulations

From time to time, legislation is drafted, introduced and passed in Congress that could significantly change the statutory provisions governing the testing, approval, manufacturing and marketing of products regulated by the FDA. In addition to new legislation, FDA regulations and policies are often revised or interpreted by the agency in ways that may significantly affect our business and our products. It is impossible to predict whether further legislative changes will be enacted or whether FDA regulations, guidance, policies or interpretations will be changed or what the effect of such changes, if any, may be.

Other U.S. Healthcare Laws and Compliance Requirements

In the United States, our activities are potentially subject to regulation by various federal, state and local authorities in addition to the FDA, including but not limited to, the Centers for Medicare and Medicaid Services, or CMS, other divisions of the U.S. Department of Health and Human Services (such as the Office of Inspector General and the Health Resources and Service Administration), the U.S. Department of Justice (DOJ) and individual U.S. Attorney offices within the DOJ, and state and local governments. For example, sales, marketing and scientific/educational grant programs may have to comply with the anti-fraud and abuse provisions of the Social Security Act, the false claims laws, the privacy and security provisions of the Health Insurance Portability and Accountability Act (HIPAA) and similar state laws, each as amended, as applicable.

The federal Anti-Kickback Statute prohibits, among other things, any person or entity, from knowingly and willfully offering, paying, soliciting or receiving any remuneration, directly or indirectly, overtly or covertly, in cash or in kind, to induce or in return for purchasing, leasing, ordering or arranging for the purchase, lease or order of any item or service reimbursable, in whole or in part, under Medicare, Medicaid or other federal healthcare programs. The term remuneration has been interpreted broadly to include anything of value. The Anti-Kickback Statute has been interpreted to apply to arrangements between therapeutic product manufacturers on one hand and prescribers, purchasers, and formulary managers on the other. 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 and practices that involve remuneration that may be alleged to be intended to induce prescribing, purchasing or recommending may be subject to scrutiny if they do not qualify for an exception or safe harbor. Failure to meet all of the requirements of a particular applicable statutory exception or regulatory safe harbor does not make the conduct per se illegal under the Anti-Kickback Statute. Instead, the legality of the arrangement will be evaluated on a case-by-case basis based on a cumulative review of all of its facts and circumstances. Our practices may not in all cases meet all of the criteria for protection under a statutory exception or regulatory safe harbor.

Additionally, the intent standard under the Anti-Kickback Statute was amended by the Patient Protection and Affordable Care Act, as amended by the Health Care and Education Reconciliation Act of 2010 (ACA), to a stricter standard such that a person or entity no longer needs to have actual knowledge of the statute or specific intent to violate it in order to have committed a violation. In addition, the ACA codified case law 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 (FCA) (discussed below).

The federal false claims and civil monetary penalty laws, including the FCA, which imposes significant penalties and can be enforced by private citizens through civil qui tam actions, prohibit any person or entity from, among other things, knowingly presenting, or causing to be presented, a false or fraudulent claim for payment to, or approval by, the federal healthcare programs, including Medicare and Medicaid, 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 U.S. government. For instance, historically, 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 the product for unapproved, off-label, and thus generally non-reimbursable, uses.

HIPAA created additional federal criminal statutes that prohibit, among other things, knowingly and willfully executing, or attempting to execute, a scheme to defraud or to obtain, by means of false or fraudulent pretenses, representations or promises, any money or property owned by, or under the control or custody of, any healthcare benefit program, including private third-party payors, willfully obstructing a criminal investigation of a healthcare offense, and knowingly and willfully falsifying, concealing or covering up by trick, scheme or device, 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. Like the Anti-Kickback Statute, the ACA amended the intent standard for certain healthcare fraud statutes under HIPAA such that a person or entity no longer needs to have actual knowledge of the statute or specific intent to violate it in order to have committed a violation.

Also, many states have similar, and typically more prohibitive, fraud and abuse statutes or regulations that apply to items and services reimbursed under Medicaid and other state programs, or, in several states, apply regardless of the payor. Additionally, to the extent that our product is sold in a foreign country, we may be subject to similar foreign laws.

We may be subject to data privacy and security regulations by both the federal government and the states in which we conduct our business. HIPAA, as amended by the Health Information Technology for Economic and Clinical Health Act (HITECH) and its implementing regulations, imposes requirements relating to the privacy, security and transmission of individually identifiable health information. Among other things, HITECH makes HIPAA's privacy and security standards directly applicable to business associates, independent contractors, or agents of covered entities that receive or obtain protected health information in connection with providing a service on behalf of a covered entity. HITECH also created four 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. In addition, many state laws govern the privacy and security of health information in specified circumstances, many of which differ from each other in significant ways, are often not pre-empted by HIPAA, and may have a more prohibitive effect than HIPAA, thus complicating compliance efforts.

Certain of our products, once approved, may be administered by a physician. Under currently applicable U.S. law, certain products not usually self-administered (including injectable drugs) may be eligible for coverage under Medicare through Medicare Part B. Medicare Part B is part of original Medicare, the federal health care program that provides health care benefits to the aged and disabled, and covers outpatient services and supplies, including certain pharmaceutical products, that are medically necessary to treat a beneficiary's health condition. As a condition of receiving Medicare Part B reimbursement for a manufacturer's eligible drugs or biologicals, the manufacturer is required to participate in other government healthcare programs, including the Medicaid Drug Rebate Program and the 340B Drug Pricing Program. The Medicaid Drug Rebate Program requires pharmaceutical manufacturers to enter into and have in effect a national rebate agreement with the Secretary of the Department of Health and Human Services as a condition for states to receive federal matching funds for the manufacturer's outpatient drugs furnished to Medicaid patients. Under the 340B Drug Pricing Program, the manufacturer must extend discounts to entities that participate in the program.

In addition, many pharmaceutical manufacturers must calculate and report certain price reporting metrics to the government, such as average sales price (ASP) and best price. Penalties may apply in some cases when such metrics are not submitted accurately and timely. Further, these prices for drugs may be reduced by mandatory discounts or rebates required by government healthcare programs or private payors and by any future relaxation of laws that presently restrict imports of drugs from countries where they may be sold at lower prices than in the United States. It is difficult to predict how Medicare coverage and reimbursement policies will be applied to our products in the future and coverage and reimbursement under different federal healthcare programs are not always consistent. Medicare reimbursement rates may also reflect budgetary constraints placed on the Medicare program.

Additionally, the federal Physician Payments Sunshine Act (Sunshine Act) within the ACA, and its implementing regulations, require that certain manufacturers of drugs, devices, biological and medical supplies for which payment is available under Medicare, Medicaid or the Children's Health Insurance Program (with certain exceptions) report annually to CMS information related to certain payments or other transfers of value made or distributed to physicians and teaching hospitals, or to entities or individuals at the request of, or designated on behalf of, the physicians and teaching hospitals and to report annually certain ownership and investment interests held by physicians and their immediate family members. Failure to report accurately could result in penalties. In addition, many states also govern the reporting of payments or other transfers of value, many of which differ from each other in significant ways, are often not pre-empted, and may have a more prohibitive effect than the Sunshine Act, thus further complicating compliance efforts.

In order to distribute products commercially, we must comply with state laws that require the registration of manufacturers and wholesale distributors of drug and biological products in a state, including, in certain states, manufacturers and distributors who ship products into the state even if such manufacturers or distributors have no place of business within the state. Some states also impose requirements on manufacturers and distributors to establish the pedigree of product in the chain of distribution, including some states that require manufacturers and others to adopt new technology capable of tracking and tracing product as it moves through the distribution chain. Several states have enacted legislation requiring pharmaceutical and biotechnology companies to establish marketing compliance programs, file periodic reports with the state, make periodic public disclosures on sales, marketing, pricing, clinical trials and other activities, and/or register their sales representatives, as well as to prohibit pharmacies and other healthcare entities from providing certain physician prescribing data to pharmaceutical and biotechnology companies for use in sales and marketing, and to prohibit certain other sales and marketing practices. All of our activities are potentially subject to federal and state consumer protection and unfair competition laws.

Ensuring business arrangements with third parties comply with applicable healthcare laws and regulations is a costly endeavor. If our operations are found to be in violation of any of the federal and state healthcare laws described above or any other current or future governmental regulations that apply to us, we may be subject to penalties, including without limitation, civil, criminal and/or administrative penalties, damages, fines, disgorgement, individual imprisonment, exclusion from participation in government programs, such as Medicare and Medicaid, injunctions, private "qui tam" actions brought by individual whistleblowers in the name of the government, or refusal to allow us to enter into government contracts, contractual damages, reputational harm, administrative burdens, diminished profits and future earnings, additional reporting obligations and oversight if we become subject to a corporate integrity agreement or other agreement to resolve allegations of non-compliance with these laws, and the curtailment or restructuring of our operations, any of which could adversely affect our ability to operate our business and our results of operations.

Coverage, Pricing and Reimbursement

Significant uncertainty exists as to the coverage and reimbursement status of any product candidates for which we may obtain regulatory approval. In the United States and in foreign markets, sales of any products for which we receive regulatory approval for commercial sale will depend, in part, on the extent to which third-party payors provide coverage and establish adequate reimbursement levels for such products. In the United States, third-party payors include federal and state healthcare programs, private managed care providers, health insurers and other organizations. Adequate coverage and reimbursement from governmental healthcare programs, such as Medicare and Medicaid in the United States, and commercial payors are critical to new product acceptance.

Our ability to commercialize any products successfully also will depend in part on the extent to which coverage and reimbursement for these products and related treatments will be available from government health administration authorities, private health insurers and other organizations. Government authorities and third-party payors, such as private health insurers and health maintenance organizations, decide which therapeutics they will pay for and establish reimbursement levels. Coverage and reimbursement by a third-party payor may depend upon a number of factors, including the third-party payor's determination that use of a therapeutic is:

- a covered benefit under its health plan;
- safe, effective and medically necessary;
- appropriate for the specific patient;
- cost-effective; and
- neither experimental nor investigational.

We cannot be sure that reimbursement will be available for any product that we commercialize and, if coverage and reimbursement are available, what the level of reimbursement will be. Coverage may also be more limited than the purposes for which the product is approved by the FDA or comparable foreign regulatory authorities. Reimbursement may impact the demand for, or the price of, any product for which we obtain regulatory approval.

Third-party payors are increasingly challenging the price, examining the medical necessity, and reviewing the cost-effectiveness of medical products, therapies and services, in addition to questioning their safety and efficacy. Obtaining reimbursement for our products may be particularly difficult because of the higher prices often associated with branded drugs and drugs administered under the supervision of a physician. We may need to conduct expensive pharmacoeconomic studies in order to demonstrate the medical necessity and cost-effectiveness of our products, in addition to the costs required to obtain FDA approvals. Our product candidates may not be considered medically necessary or cost-effective. Obtaining coverage and reimbursement approval of a product from a government or other third-party payor is a time-consuming and costly process that could require us to provide to each payor supporting scientific, clinical and cost-effectiveness data for the use of our product on a payor-by-payor basis, with no assurance that coverage and adequate reimbursement will be obtained. A payor's decision to provide coverage for a product does not imply that an adequate reimbursement rate will be approved. Further, one payor's determination to provide coverage for a product does not assure that other payors will also provide coverage for the product. Adequate third-party reimbursement may not be available to enable us to maintain price levels sufficient to realize an appropriate return on our investment in product development. If reimbursement is not available or is available only at limited levels, we may not be able to successfully commercialize any product candidate that we successfully develop.

Different pricing and reimbursement schemes exist in other countries. In the European Union, governments influence the price of pharmaceutical products through their pricing and reimbursement rules and control of national health care systems that fund a large part of the cost of those products to consumers. Some jurisdictions operate positive and negative list systems under which products may only be marketed once a reimbursement price has been agreed. To obtain reimbursement or pricing approval, some of these countries may require the completion of clinical trials that compare the cost effectiveness of a particular product candidate to currently available therapies. Other member states allow companies to fix their own prices for medicines, but monitor and control company profits. The downward pressure on health care costs has become intense. As a result, increasingly high barriers are being erected to the entry of new products. In addition, in some countries, cross-border imports from low-priced markets exert a commercial pressure on pricing within a country.

The marketability of any product candidates for which we receive regulatory approval for commercial sale may suffer if the government and third-party payors fail to provide adequate coverage and reimbursement. In addition, emphasis on managed care, the increasing influence of health maintenance organizations, and additional legislative changes in the United States has increased, and we expect will continue to increase, the pressure on healthcare pricing. The downward pressure on the rise in healthcare costs in general, particularly prescription medicines, medical devices and surgical procedures and other treatments, has become very intense. Coverage policies and third-party reimbursement rates may change at any time. Even if favorable coverage and reimbursement status is attained for one or more products for which we receive regulatory approval, less favorable coverage policies and reimbursement rates may be implemented in the future.

Healthcare Reform

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 the ability to profitably sell product candidates for which marketing approval is obtained. 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.

For example, the ACA has substantially changed healthcare financing and delivery by both governmental and private insurers. Among the ACA provisions of importance to the pharmaceutical and biotechnology industries, in addition to those otherwise described above, are the following:

- an annual, nondeductible fee on any entity that manufactures or imports certain specified branded prescription drugs and biologic agents apportioned among these entities according to their market share in some government healthcare programs that began in 2011;
- an increase in the statutory minimum rebates a manufacturer must pay under the Medicaid Drug Rebate Program, retroactive to January 1, 2010, to 23.1% and 13% of the average manufacturer price for most branded and generic drugs, respectively, and capped the total rebate amount for innovator drugs at 100% of the Average Manufacturer Price (AMP);
- a new Medicare Part D coverage gap discount program, in which manufacturers must agree to offer 50% point-of-sale discounts off negotiated prices of applicable brand drugs to eligible beneficiaries during their coverage gap period, as a condition for the manufacturers' outpatient drugs to be covered under Medicare Part D;
- extension of manufacturers' Medicaid rebate liability to covered drugs dispensed to individuals who are enrolled in Medicaid managed care organizations;
- expansion of eligibility criteria for Medicaid programs by, among other things, allowing states to offer Medicaid coverage to additional individuals beginning in 2014 and by adding new mandatory eligibility categories for individuals with income at or below 133% of the federal poverty level, thereby potentially increasing manufacturers' Medicaid rebate liability;
- expansion of the entities eligible for discounts under the 340B Drug Discount Program;
- a new Patient-Centered Outcomes Research Institute to oversee, identify priorities in, and conduct comparative clinical effectiveness research, along with funding for such research;
- expansion of healthcare fraud and abuse laws, including the FCA and the Anti-Kickback Statute, new government investigative powers, and enhanced penalties for noncompliance;
- 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;
- requirements to report certain financial arrangements with physicians and teaching hospitals;

- a requirement to annually report certain information regarding drug samples that manufacturers and distributors provide to physicians;
- establishment of a Center for Medicare Innovation at CMS to test innovative payment and service delivery models to lower Medicare and Medicaid spending, potentially including prescription drug spending that began on January 1, 2011; and
- a licensure framework for follow on biologic products.

Some of the provisions of the ACA have yet to be implemented, and there have been legal and political challenges to certain aspects of the ACA. Since January 2017, President Trump has signed two executive orders and other directives designed to delay, circumvent, or loosen certain requirements mandated by the ACA. In December 2017, Congress repealed the tax penalty for an individual's failure to maintain ACA-mandated health insurance as part of a tax reform bill. Congress is continuing to consider legislation that would alter other aspects of the ACA.

We anticipate that the ACA, if substantially maintained in its current form, will continue to result in additional downward pressure on coverage and the price that we receive for any approved product, and could seriously harm our business. Any reduction in reimbursement from Medicare and 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 products. Such reforms could have an adverse effect on anticipated revenue from product candidates that we may successfully develop and for which we may obtain regulatory approval and may affect our overall financial condition and ability to develop product candidates.

Further legislation or regulation could be passed that could harm our business, financial condition and results of operations. Other legislative changes have been proposed and adopted since the ACA was enacted. For example, in August 2011, President Obama signed into law the Budget Control Act of 2011, which, among other things, created the Joint Select Committee on Deficit Reduction to recommend to Congress proposals in spending reductions. The Joint Select Committee on Deficit Reduction did not achieve a targeted deficit reduction of at least $1.2 trillion for fiscal years 2012 through 2021, triggering the legislation's automatic reduction to several government programs. This includes aggregate reductions to Medicare payments to providers of up to 2% per fiscal year, which went into effect beginning on April 1, 2013 and will stay in effect through 2025 unless additional Congressional action is taken.

Additionally, there has been increasing legislative and enforcement interest in the United States with respect to specialty drug pricing practices. Specifically, there have been several recent U.S. Congressional inquiries and proposed federal legislation designed to, among other things, bring more transparency to drug pricing, reduce the cost of prescription drugs under Medicare, review the relationship between pricing and manufacturer patient programs, and reform government program reimbursement methodologies for drugs. Individual states in the United States have also become increasingly aggressive in passing legislation and implementing 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.

The Foreign Corrupt Practices Act

The Foreign Corrupt Practices Act (FCPA), prohibits any U.S. 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 us 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.

Additional Regulation

In addition to the foregoing, state and federal laws regarding environmental protection and hazardous substances, including the Occupational Safety and Health Act, the Resource Conservancy and Recovery Act and the Toxic Substances Control Act, affect our business. These and other laws govern our use, handling and disposal of various biological, chemical and radioactive substances used in, and wastes generated by, our operations. If our operations result in contamination of the environment or expose individuals to hazardous substances, we could be liable for damages and governmental fines. We believe that we are in material compliance with applicable environmental laws and that continued compliance therewith will not have a material adverse effect on our business. We cannot predict, however, how changes in these laws may affect our future operations.

Other Regulations

We are also subject to numerous federal, state and local laws relating to such matters as safe working conditions, manufacturing practices, environmental protection, fire hazard control, and disposal of hazardous or potentially hazardous substances. We may incur significant costs to comply with such laws and regulations now or in the future.

Rest of World Government Regulation

In addition to regulations in the United States, we will be subject to a variety of regulations in other jurisdictions governing, among other things, clinical trials and any commercial sales and distribution of our products. Whether or not we obtain FDA approval to conduct clinical trials or market a product, we must obtain the requisite approvals from regulatory authorities in foreign jurisdictions prior to the commencement of clinical trials or marketing of the product in those countries. The requirements and process governing the conduct of clinical trials, product licensing, pricing and reimbursement vary from country to country. In all cases, again, the clinical trials must be conducted in accordance with GCP and the applicable regulatory requirements. Because biologically sourced raw materials are subject to unique contamination risks, their use may be restricted in some countries.

The EU General Data Protection Regulation (GDPR) also applies to health-related and other personal data of individuals in the European Union. The GPDR, which went into effect in May 2018, imposes more stringent operational requirements on processors and controllers of personal data, including, for example, expanded disclosures about how personal data is collected, used and shared, limitations on retention of personal data, more stringent requirements pertaining to genetic, biometric and health data, mandatory data breach notification requirements, and higher standards for controllers to demonstrate valid consent for certain data processing activities. The GDPR further provides that European Union Member States may implement their own additional laws and regulations in relation to the processing of genetic, biometric or health data, which could result in differences in the GDPR's implementation among Member States. The GDPR increases our responsibility and liability in relation to personal data that we process, and we must put in place additional mechanisms to ensure compliance with the new EU data protection rules.

Australia

Conducting clinical trials for therapeutic drug candidates in Australia is subject to regulation by Australian regulatory bodies. The Therapeutic Goods Administration (TGA) and the National Health and Medical Research Council set the codes of Good Clinical Practice (GCP) for clinical research in Australia, and compliance with these codes is mandatory. Australia has also adopted international codes, such as those promulgated by the International Conference on Harmonization of Technical Requirements for Registration of Pharmaceuticals for Human Use (the ICH). The ICH guidelines must be complied with across all fields of clinical research, including those related to pharmaceutical quality, nonclinical and clinical data requirements and trial designs. The basic requirements for preclinical data to support a first-in-human trial under ICH guidelines are applicable in Australia. Requirements related to adverse event reporting in Australia are similar to those required in other major jurisdictions.

Clinical trials conducted using "unapproved therapeutic goods" in Australia, being those which have not yet been evaluated by the TGA for quality, safety and efficacy must occur pursuant to either the Clinical Trial Notification Scheme (CTN Scheme), or the Clinical Trial Exemption Scheme (CTX Scheme). In each case, the trial is supervised by a Human Research Ethics Committee (HREC) an independent review committee set up under guidelines of the Australian National Health and Medical Research Council that ensures the protection of rights, safety and well-being of human subjects involved in a clinical trial. A HREC does this by reviewing, approving and providing continuing examination of trial protocols and amendments, and of the methods and material to be used in obtaining and documenting informed consent of the trial subjects.

The CTN Scheme broadly involves:

- completion of pre-clinical laboratory and animal testing;
- submission to a HREC, of all material relating to the proposed clinical trial, including the trial protocol;
- the institution or organisation at which the trial will be conducted, referred to as the "Approving Authority", giving final approval for the conduct of the trial at the site, having regard to the advice from the HREC;
- the investigator submitting a 'Notification of Intent to Conduct a Clinical Trial' form (the CTN Form) to the TGA. The CTN form must be signed by the sponsor, the principal investigator, the chairman of the HREC and a person responsible from the Approving Authority. The TGA does not review any data relating to the clinical trial however CTN trials cannot commence until the trial has been notified to the TGA.

Under the CTX Scheme:

- a sponsor submits an application to conduct a clinical trial to the TGA for evaluation and comment; and
- a sponsor must forward any comments made by the TGA Delegate to the HREC(s) at the sites where the trial will be conducted.

A sponsor cannot commence a trial under the CTX Scheme until written advice has been received from the TGA regarding the application and approval for the conduct of the trial has been obtained from an ethics committee and the institution at which the trial will be conducted.

Approval for inclusion in the Australian Register of Therapeutic Goods (ARTG) is required before a pharmaceutical product may be marketed (or imported, exported or manufactured) in Australia. In order to obtain registration of the product on the ARTG, it is required that:

- adequate and well-controlled clinical trials demonstrate the quality, safety and efficacy of the therapeutic product;
- evidence is compiled which demonstrates that the manufacture of the therapeutic product complies with the principles of cGMP;
- manufacturing and clinical data is derived to submit to the Advisory Committee on Prescription Medicines, which makes recommendations to the TGA as to whether or not to grant approval to include the therapeutic product in the ARTG; and
- an ultimate decision is made by the TGA whether to include the therapeutic product in the ARTG.

Employees

As of February 1, 2019, we had 108 full-time employees, 54 of whom hold Ph.D. or M.D. degrees. Of these employees, 89 were engaged in research and development activities and 19 were engaged in general and administrative activities. None of our employees are represented by labor unions or covered by collective bargaining agreements. We consider our relationship with our employees to be good.

Corporate Information

We were incorporated under the laws of the State of Delaware in April 2015. Our principal executive offices are located 3928 Point Eden Way, Hayward, CA 94545, and our telephone number is (510) 694-6200. Our website address is www.arcusbio.com. The information on, or that can be accessed through, our website is not incorporated by reference into this Annual Report on Form 10-K.

We are an "emerging growth company" as defined in the Jumpstart Our Business Startups Act of 2012. We will remain an emerging growth company until the earlier of (1) the last day of the fiscal year (a) ending December 31, 2023, (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.

We operate and manage our business as one reportable and operating segment. See Note 2 to our audited financial statement included elsewhere in this Annual Report on Form 10-K for additional information.

We file Annual Reports on Form 10-K, Quarterly Reports on Form 10-Q, Current Reports on Form 8-K and other information with the Securities and Exchange Commission (SEC). Our filings with the SEC are available free of charge on the SEC's website at *www.sec.gov* and on our website under the "Investors" tab as soon as reasonably practicable after we electronically file such material with, or furnish it to, the SEC.

Item 1A. Risk Factors

You should consider carefully the following risk factors, together with all the other information in this report, including our consolidated financial statements and notes thereto, and in our other public filings with the SEC. The occurrence of any of the following risks could harm our business, financial condition, results of operations and/or growth prospects or cause our actual results to differ materially from those contained in forward-looking statements we have made in this report and those we may make from time to time. You should consider all of the risk factors described when evaluating our business.

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

We are an early-stage immuno-oncology company with a very limited operating history. We have incurred net losses since our inception and anticipate that we will continue to incur significant losses for the foreseeable future. We have never generated any revenue from product sales and may never be profitable.

We are an early-stage immuno-oncology company with a very limited operating history that may make it difficult to evaluate the success of our business to date and to assess our future viability. Our operations have been limited to organizing and staffing our company, business planning, raising capital, identifying potential product candidates, establishing licensing arrangements and/or acquiring any necessary technology, and undertaking research and preclinical studies and clinical trials of our product candidates. All of our product candidates are in early development, and none have been approved for commercial sale. We have never generated any revenue from product sales and have incurred net losses each year since we commenced operations. For the years ended December 31, 2018 and 2017, our net losses were $49.6 million and $53.1 million, respectively. As of December 31, 2018, we had an accumulated deficit of $122.8 million. We expect that it will be several years, if ever, before we have a product candidate ready for commercialization. We expect to incur increasing levels of operating losses over the next several years and for the foreseeable future as we advance our product candidates. Our prior losses, combined with expected future losses, have had and will continue to have an adverse effect on our stockholders' equity (deficit) and working capital.

To become and remain profitable, we must develop and eventually commercialize a product with significant market potential. This will require us to be successful in a range of challenging activities, including completing preclinical studies and clinical trials of our product candidates, obtaining marketing approval for these product candidates, manufacturing, marketing and selling those products for which we may obtain marketing approval and satisfying any post-marketing requirements. We may never succeed in these activities and, even if we succeed in commercializing one or more of our product candidates, we may never generate revenue that are significant or large enough to achieve profitability. In addition, as a young business, we may encounter unforeseen expenses, difficulties, complications, delays and other known and unknown challenges. If we do achieve profitability, we may not be able to sustain or increase profitability on a quarterly or annual basis and we will continue to incur substantial research and development and other expenditures to develop and market additional product candidates. Our failure to become and remain profitable would decrease the value of the company and could impair our ability to raise capital, maintain our research and development efforts, expand our business or continue our operations. A decline in the value of our company could also cause our stockholders to lose all or part of their investment.

We will need to obtain substantial additional funding to complete the development and any commercialization of our product candidates. If we are unable to raise this capital when needed, we may be forced to delay, reduce or eliminate our product development programs or other operations.

Since our inception, we have used substantial amounts of cash to fund our operations and expect our expenses to increase substantially during the next few years. The development of biopharmaceutical product candidates is capital intensive. As our product candidates enter and advance through preclinical studies and clinical trials, we will need substantial additional funds to expand our clinical, regulatory, quality and manufacturing capabilities. In addition, if we obtain marketing approval for any of our product candidates, we expect to incur significant commercialization expenses related to marketing, sales, manufacturing and distribution.

As of December 31, 2018, we had $259.7 million in cash and investments, which included $256.5 million in cash, cash equivalents and short-term investments. Based on our current operating plan, we believe that our existing cash, cash equivalents and short-term investments will be sufficient to fund the clinical development of AB928 and AB122, including cohort expansion studies, into 2021, but not through regulatory approval. Accordingly, we will need to raise substantial additional capital to complete the development and commercialization of our product candidates.

We have based these estimates on assumptions that may prove to be incorrect or require adjustment as a result of business decisions, and we could utilize our available capital resources sooner than we currently expect. Our future capital requirements will depend on many factors, including:

- the scope, rate of progress and costs of our drug discovery, preclinical development activities, laboratory testing and clinical trials for our product candidates;
- the number and scope of clinical programs we decide to pursue;
- the scope and costs of manufacturing development and commercial manufacturing activities;
- the timing and amount of milestone payments we receive from Taiho Pharmaceuticals Co., Ltd. (Taiho) under our option and license agreement (the Taiho Agreement);
- the extent to which we acquire or in-license other product candidates and technologies;
- the cost, timing and outcome of regulatory review of our product candidates;
- the cost and timing of establishing sales and marketing capabilities, if any of our product candidates receive marketing approval;
- the costs of preparing, filing and prosecuting patent applications, maintaining and enforcing our intellectual property rights and defending intellectual property-related claims;
- our ability to establish and maintain collaborations on favorable terms, if at all;

- our efforts to enhance operational systems and our ability to attract, hire and retain qualified personnel, including personnel to support the development of our product candidates;
- the costs associated with being a public company; and
- the cost associated with commercializing our product candidates, if they receive marketing approval.

Identifying potential product candidates and conducting preclinical studies 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 marketing approval. In addition, our product candidates, if approved, may not achieve product sales or commercial success. We do not expect to have any products commercially available for sale for many years, if at all. Accordingly, we will need to obtain substantial additional funding in connection with our continuing operations. If we are unable to raise capital when needed or on attractive terms, we would be forced to delay, reduce or eliminate our research and development programs or future commercialization efforts.

The amount of our future losses is uncertain and our quarterly operating results may fluctuate significantly or may fall below the expectations of investors or securities analysts, each of which may cause our stock price to fluctuate or decline.

Our quarterly and annual operating results may fluctuate significantly in the future due to a variety of factors, many of which are outside of our control and may be difficult to predict, including the following:

- the timing and success or failure of clinical trials for our product candidates or competing product candidates, or any other change in the competitive landscape of our industry, including consolidation among our competitors or partners;
- our ability to successfully recruit and retain subjects for clinical trials, and any delays caused by difficulties in such efforts;
- our ability to obtain marketing approval for our product candidates, and the timing and scope of any such approvals we may receive;
- the timing and cost of, and level of investment in, research and development activities relating to our product candidates, which may change from time to time;
- the cost of manufacturing our product candidates, which may vary depending on the quantity of production and the terms of our agreements with manufacturers;
- our ability to attract, hire and retain qualified personnel;
- expenditures that we will or may incur to develop additional product candidates;
- the level of demand for our product candidates should they receive approval, which may vary significantly;
- the risk/benefit profile, cost and reimbursement policies with respect to our product candidates, if approved, and existing and potential future therapeutics that compete with our product candidates;
- the changing and volatile U.S. and global economic environments; and
- future accounting pronouncements or changes in our accounting policies.

The cumulative effects of these factors could result in large fluctuations and unpredictability in our quarterly and annual operating results. As a result, comparing our operating results on a period-to-period basis may not be meaningful. This variability and unpredictability could also result in our failing to meet the expectations of industry or financial analysts or investors for any period. If our revenue or operating results fall below the expectations of analysts or investors or below any forecasts we may provide to the market, or if the forecasts we provide to the market are below the expectations of analysts or investors, the price of our common stock could decline substantially. Such a stock price decline could occur even when we have met any previously publicly stated guidance we may provide.

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 product revenue, we expect to finance our cash needs through a combination of equity offerings, debt financings, collaborations, strategic alliances and licensing arrangements. To the extent that we raise additional capital through the sale of equity or convertible debt securities, our stockholders' ownership interests will be diluted and the terms of these securities may include liquidation or other preferences that adversely affect their rights as common stockholders. Debt financing, if available, may involve agreements that include covenants limiting or restricting our ability to take specific actions, such as incurring additional debt, making capital expenditures or declaring dividends. If we raise funds through collaborations, strategic alliances or licensing arrangements with third parties, we may have to relinquish valuable rights to our technologies, future revenue streams, research programs or product candidates or grant licenses on terms that may not be favorable to us. 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.

Risks Related to the Discovery and Development of our Product Candidates

Our product candidates are in the early stages of development. We only recently began clinical trials to test some of our product candidates in humans and, as a company, we have limited experience in this area.

We are early in our development efforts and our operations to date have been limited to drug discovery, preclinical studies and Phase 1 clinical trials. While most of our clinical trial activity to date has been outside the United States, we have initiated several trials in the United States. As a result, we will need to expand our clinical operations, quality and regulatory capabilities to support these activities.

Our interactions with the FDA have been limited to the initiation of our Phase 1 trials. Because of these limited interactions, we may subsequently learn of certain information or data that the FDA may request, which may necessitate conducting additional preclinical studies or generating such information at significant cost in terms of both time and expense, including under a clinical hold imposed on an investigational new drug application (IND). Even if we conducted the additional studies or generated the additional information requested, the FDA could disagree that we have satisfied their requirements, all of which will cause significant delays to our programs.

In part because of our limited infrastructure, experience conducting clinical trials as a company and regulatory interactions, we cannot be certain that our clinical trials will be completed on time, that our planned clinical trials will be initiated on time, if at all, that our planned development programs would be acceptable to the FDA or other comparable foreign regulatory authorities, or that, if approval is obtained, such product candidates can be successfully commercialized.

Our ability to generate product revenue, which we do not expect will occur for many years, if ever, will depend heavily on our ability to successfully complete the above activities and any other activities required for the successful development and eventual commercialization of one or more of our product candidates. The success of our product candidates will further depend on factors such as:

- successful completion of preclinical studies;
- permission to proceed under regulatory applications for our planned clinical trials or future clinical trials;
- successful enrollment in, and completion of, clinical trials;
- receipt of marketing approvals from applicable regulatory authorities;
- establishing manufacturing capabilities or arrangements with third party manufacturers for clinical supply and, if and when approved, for commercial supply;
- establishing sales, marketing and distribution capabilities and launching commercial sales of our products, if and when approved, whether alone or in combination with others;
- acceptance of our products, if and when approved, by patients, the medical community and third-party payors;
- effectively competing with other therapies;

- developing and implementing marketing and reimbursement strategies;
- obtaining and maintaining third party coverage and adequate reimbursement;
- obtaining and maintaining patent, trade secret and other intellectual property protection and regulatory exclusivity for our product candidates;
- the ability to obtain clearance or approval of companion diagnostic tests, if required, on a timely basis, or at all; and
- maintaining a continued acceptable safety profile of any product following approval.

If we do not achieve one or more of these factors in a timely manner, we could experience significant delays or an inability to successfully commercialize our product candidates, which would materially harm our business.

Clinical drug development is a lengthy, expensive and uncertain process. The results of preclinical studies and early clinical trials are not always predictive of future results. Any product candidate that we advance into clinical trials may not achieve favorable results in later clinical trials, if any, or receive marketing approval.

The research and development of drugs and biological products is an extremely risky industry. Only a small percentage of product candidates that enter the development process ever receive marketing 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 and efficacy of our product candidates in humans. Clinical testing is expensive, can take many years to complete and its outcome is uncertain.

The results of preclinical and early clinical trials of our product candidates and other products with the same mechanism of action may not be predictive of the results of later-stage clinical trials. Clinical trial failure may result from a multitude of factors including flaws in study design, dose selection, placebo effect, patient enrollment criteria and failure to demonstrate favorable safety or efficacy traits. As such, failure in clinical trials can occur at any stage of testing. A number of companies in the biopharmaceutical industry have suffered setbacks in the advancement of clinical trials due to lack of efficacy or adverse safety profiles, notwithstanding promising results in earlier trials. Based upon negative or inconclusive results, we may decide, or regulators may require us, to conduct additional clinical trials or preclinical studies. In addition, data obtained from clinical trials are susceptible to varying interpretations, and regulators may not interpret our data as favorably as we do, which may further delay, limit or prevent marketing approval. In particular, results from uncontrolled trials, meaning trials in which there is no control group such as a placebo group, are inherently difficult to interpret. Clinical trials evaluating two or more investigational product candidates in combination that have not yet been approved can compound these difficulties. As a key element of our strategy is the development of intra-portfolio combinations, many of our clinical trials will test more than one investigational product candidates in uncontrolled studies, such as the clinical trials in our Phase 1/1b program for AB928 where we are evaluating AB928 in combination with AB122, and the Phase 1 trial for AB154 which will evaluate AB154 in combination with AB122. Furthermore, as more product candidates within a particular class of drugs proceed through clinical development to regulatory review and approval, the amount and type of clinical data that may be required by regulatory authorities may increase or change.

We currently have four product candidates in clinical development and their risk of failure is high. We are unable to predict if these product candidates or any of our future product candidates that advance into clinical trials will prove safe or effective in humans or will obtain marketing approval. If we are unable to complete preclinical or clinical trials of current or future product candidates, due to safety concerns, or if the results of these trials are not satisfactory to convince regulatory authorities of their safety or efficacy, we will not be able to obtain marketing approval for commercialization. Even if we are able to obtain marketing approvals for any of our product candidates, those approvals may be for indications that are not as broad as desired or may contain other limitations that would adversely affect our ability to generate revenue from sales of those products. Moreover, if we are not able to differentiate our product against other approved products within the same class of drugs, or if any of the other circumstances described above occur, our business would be materially harmed and our ability to generate revenue from that class of drugs would be severely impaired.

A key element of our strategy is the development of intra-portfolio combinations. If we are not successful in discovering, developing and commercializing product candidates that take advantage of different mechanisms of action to achieve superior outcomes relative to the use of single agents or other combination therapies, our ability to achieve our strategic objectives would be impaired.

A key element of our strategy is to build a broad portfolio of product candidates that will allow for the development of intra-portfolio combinations. We believe that by developing or licensing these product candidates, we can control the combinations we pursue and, if and when approved, maximize the commercial potential of these combinations.

However, these combinations have not been tested before and may fail to demonstrate synergistic activity against immunological targets, may fail to achieve superior outcomes relative to the use of single agents or other combination therapies, may exacerbate adverse events associated with one of the product candidates when used as monotherapy, or may fail to demonstrate sufficient safety or efficacy traits in clinical trials to enable us to complete those clinical trials or obtain marketing approval for the combination therapy. In addition, it may be difficult to interpret the results of any uncontrolled trials we conduct with our intra-portfolio combinations, such as the clinical trials in our Phase 1/1b program for AB928 where we are evaluating AB928 in combination with AB122, and the Phase 1 trial for AB154 which will evaluate AB154 in combination with AB122.

We expect that our anti-PD-1 antibody, AB122, will form the backbone of many of our intra-portfolio combinations. In the event that AB122, which is currently in a Phase 1 trial, were to fail to demonstrate sufficient safety and efficacy, we would need to identify alternatives for accessing an anti-PD-1 antibody. In the event we are unable to do so, or are unable to do so on commercially reasonable terms, our business and prospects would be materially harmed. All of our product candidates are targeting mechanisms that other companies are pursuing as either monotherapy or combination products. As such, even if we are successful in developing combination therapies, competition from other product candidates in the same class which are either already approved or further along in development than ours may prevent us from realizing the commercial potential of our combination therapies and prevent us from achieving our strategic objectives.

Our intra-portfolio combination strategy relies on discovering, developing and commercializing highly differentiated small molecules. If we are not able to differentiate our small molecules from other products which are approved or in development, our business prospects would be materially adversely affected.

Our combination therapy strategy relies on discovering and developing differentiated small molecules with ideal pharmacologic properties for the targeted pathway to complement our antibody product candidates, which we believe will form the backbone of our combination therapies. We conduct in our laboratories those activities that we consider to be critical for creating a development candidate with optimal properties. These activities include medicinal chemistry, assay development, assessment of compound potency and selectivity, *in vitro* and *in vivo* pharmacokinetic profile evaluation, *in vivo* pharmacology and exploratory safety evaluation, among others. As such, we have invested heavily in these internal capabilities and over 80% of our current workforce is dedicated to research and development. If the small molecules that we discover and design do not have ideal pharmacologic properties, or are not differentiated from other product candidates in development, either through their efficacy or toxicity profile, our product development activities, business and prospects would be materially harmed.

Serious adverse events, undesirable side effects or other unexpected properties of our product candidates may be identified during development or after approval, which could lead to the discontinuation of our clinical development programs, refusal by regulatory authorities to approve our product candidates or, if discovered following marketing approval, revocation of marketing authorizations or limitations on the use of our product candidates thereby limiting the commercial potential of such product candidate.

To date, we have only tested our clinical-stage product candidates in a limited number of oncology subjects. As we continue our development of these product candidates and initiate clinical trials of our additional product candidates, serious adverse events, undesirable side effects or unexpected characteristics may emerge causing us to abandon these product candidates or limit their development to more narrow uses or subpopulations in which the serious adverse events, undesirable side effects or other characteristics are less prevalent, less severe or more acceptable from a risk-benefit perspective. Even if our product candidates initially show promise in these early clinical trials, the side effects of drugs are frequently only detectable after they are tested in large, Phase 3 clinical trials or, in some cases, after they are made available to patients on a commercial scale after approval. Sometimes, it can be difficult to determine if the serious adverse or unexpected side effects were caused by the product candidate or another factor, especially in oncology subjects who may suffer from other medical conditions and be taking other medications. If serious adverse or unexpected side effects are identified during development and are determined to be attributed to our product candidate, we may be required to develop a Risk Evaluation and Mitigation Strategy (REMS) to mitigate those serious safety risks, which could impose significant distribution and use restrictions on our products.

Drug-related side effects could also affect subject recruitment or the ability of enrolled subjects to complete the trial or result in potential product liability claims. Any of these occurrences may harm our business, financial condition and prospects significantly.

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

- regulatory authorities may withdraw approvals of such product;
- regulatory authorities may require additional warnings on the label;
- 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; and
- our reputation may suffer.

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

Lack of efficacy, adverse events or undesirable side effects may emerge in clinical trials conducted by third parties investigating the same product candidates as us in different territories, which could adversely affect our development program.

Lack of efficacy, adverse events or undesirable side effects may emerge in clinical trials conducted by third parties investigating the same product candidates as us in different territories. For example, we and Harbin Gloria Pharmaceuticals Co. Ltd. (Gloria Pharmaceuticals) each licensed our rights to the same anti-PD-1 antibody (which we refer to as AB122) from WuXi Biologics (Cayman) Inc. (WuXi Biologics). Gloria Pharmaceuticals refers to this antibody as GLS-010 and is conducting clinical trials with GLS-010 in China. We have no control over their clinical trials or development program, and lack of efficacy, adverse events or undesirable side effects experienced by subjects in their clinical trials could adversely affect our development of AB122 or even the viability of AB122 as a product candidate. We may be required to report Gloria Pharmaceuticals' adverse events or unexpected side effects to the FDA or comparable foreign regulatory authorities, which could, among other things, order us to cease further development of AB122. We may face similar risks if Taiho exercises its option to license development rights to any of our programs under the Taiho Agreement.

Enrollment and retention of subjects in clinical trials is expensive and time consuming, can be made more difficult or rendered impossible by competing treatments or clinical trials of competing product candidates in the same or other indications, and could result in significant delays and additional costs in our product development activities, or in the failure of such activities.

We may encounter delays in enrolling, or be unable to enroll and maintain, a sufficient number of subjects to complete any of our clinical trials. Patient enrollment and retention in clinical trials is a significant factor in the timing of clinical trials and depends on many factors, including the size of the patient population required for analysis of the trial's primary endpoints, the nature of the trial protocol, our ability to recruit clinical trial investigators with the appropriate competencies and experience, the existing body of safety and efficacy data with respect to the product candidate, the number and nature of competing products or product candidates and ongoing clinical trials of competing product candidates for the same indication, the proximity of subjects to clinical trial sites, the eligibility criteria for the clinical trial and our ability to obtain and maintain subject consents.

For example, enrollment of oncology subjects in our AB122 clinical trial may be hampered by nivolumab from Bristol-Myers Squibb and pembrolizumab from Merck, both of which are approved and on the market. Subjects may opt to be treated with an approved product with substantially more safety and efficacy data than is currently available for our anti-PD-1 antibody product candidate. Bristol-Myers Squibb and Merck may also be conducting clinical trials of these products in additional indications, and some of those clinical sites may also participate in our clinical trials, which could reduce the number of subjects available for our clinical trials at those sites.

Furthermore, any negative results that we may report in clinical trials of our product candidates may make it difficult or impossible to recruit and retain subjects in other clinical trials of that same product candidate. Delays in patient enrollment may result in increased costs or may affect the timing or outcome of the planned clinical trials, which could prevent completion of these trials and adversely affect our ability to advance the development of our product candidates. Failures in planned subject enrollment or retention may result in increased costs or program delays and could render further development impossible.

Certain of our product candidates may require companion diagnostics in certain indications. Failure to successfully develop, validate and obtain regulatory clearance or approval for such tests could harm our product development strategy or prevent us from realizing the full commercial potential of our product candidates.

Certain of our product candidates may require companion diagnostics to identify appropriate patients for those product candidates in certain indications. Companion diagnostics are subject to regulation by the FDA and comparable foreign regulatory authorities as a medical device and may require separate regulatory authorization prior to commercialization. We may rely on third parties for the design, development, testing and manufacturing of these companion diagnostics, the application for and receipt of any required regulatory authorization, and the commercial supply of these companion diagnostics. If these parties are unable to successfully develop companion diagnostics for these product candidates, or experience delays in doing so, the development of our product candidates may be adversely affected and we may not be able to obtain marketing authorization for these product candidates. Furthermore, our ability to market and sell, as well as the commercial success, of any of our product candidates that require a companion diagnostic will be tied to, and dependent upon, the receipt of required regulatory authorization and the continued ability of such third parties to make the companion diagnostic commercially available on reasonable terms in the relevant geographies. Any failure to develop, validate, obtain and maintain marketing authorization for a companion diagnostic and supply such companion diagnostic will harm our business, results of operations and financial condition.

The design or our execution of our ongoing and future clinical trials may not support marketing approval.

The design or execution of a clinical trial can determine whether its results will support marketing approval, and flaws in the design or execution of a clinical trial may not become apparent until the clinical trial is well advanced. In some instances, there can be significant variability in safety or efficacy results between different trials with the same product candidate due to numerous factors, including differences in trial protocols, size and type of the patient populations, variable adherence to the dosing regimen or other protocol requirements and the rate of dropout among clinical trial participants. Furthermore, results from uncontrolled trials, meaning there is no control group such as a placebo group, are inherently difficult to interpret, especially where the clinical trial is evaluating two or more investigational product candidates in combination that have not yet been approved. As a key element of our strategy is the development of intra-portfolio combinations, many of our clinical trials will test more than one investigational product candidates in uncontrolled studies, such as the clinical trials in our Phase 1/1b program for AB928 where we are evaluating AB928 in combination with AB122, and the Phase 1 trial for AB154 which will evaluate AB154 in combination with AB122. We do not know whether any clinical trials we conduct will demonstrate consistent or adequate efficacy and safety to obtain marketing approval to market our product candidates. The FDA and comparable foreign regulatory authorities have substantial discretion in the approval process and in determining when or whether marketing approval will be obtained for any of our product candidates. Our product candidates may not be approved even if they achieve their primary endpoints in future Phase 3 clinical trials or registrational trials. The FDA or comparable foreign regulatory authorities may disagree with our trial designs and our interpretation of data from preclinical studies or clinical trials. In addition, any of these regulatory authorities may change requirements for the approval of a product candidate even after reviewing and providing comments or advice on a protocol for a pivotal Phase 3 or registrational clinical trial that has the potential to result in FDA or other comparable foreign regulatory authorities' approval. In addition, any of these regulatory authorities may also approve a product candidate for fewer or more limited indications than we request or may grant approval contingent on the performance of costly post-marketing clinical trials. The FDA or comparable foreign regulatory authorities may not approve the labeling claims that we believe would be necessary or desirable for the successful commercialization of our product candidates, if approved.

To date, most of our clinical trial activity has been outside the United States, and the FDA may not accept data from trials conducted in foreign locations.

To date, most of our clinical trial activity has been outside the United States. Although the FDA may accept data from clinical trials conducted outside the United States, acceptance of these data is subject to certain conditions imposed by the FDA. For example, the clinical trial must be well designed and conducted and performed by qualified investigators in accordance with ethical principles. The trial population must also adequately represent the U.S. population, and the data must be applicable to the U.S. population and U.S. medical practice in ways that the FDA deems clinically meaningful. In general, the patient population for any clinical trials conducted outside the United States must be representative of the population for whom we intend to label the product in the United States. In addition, while these clinical trials are subject to the applicable local laws, FDA acceptance of the data will be dependent upon its determination that the trials also complied with all applicable U.S. laws and regulations. We cannot assure you that the FDA will accept data from trials conducted outside the United States. If the FDA does not accept the data from such clinical trials, it would likely result in the need for additional trials, which would be costly and time-consuming and delay or permanently halt our development of our product candidates.

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 managerial resources, we must prioritize our research programs and will need to focus our product candidates on the potential treatment of certain indications. As a result, we may forego or delay pursuit of opportunities with other product candidates or for other indications 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 research and 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 also 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.

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

Before we can initiate clinical trials in the United States for our product candidates, we must submit the results of preclinical testing to the FDA along with other information, including information about product candidate chemistry, manufacturing and controls (CMC) and our proposed clinical trial protocol, as part of an IND. We do not know whether our planned trials will begin on time or be completed on schedule, if at all. The commencement and completion of clinical trials can be delayed for a number of reasons, including delays related to:

- the FDA placing the clinical trial on hold;
- subjects failing to enroll or remain in our trial at the rate we expect;
- subjects choosing an alternative treatment or other product candidates, or participating in competing clinical trials;
- lack of adequate funding to continue the clinical trial;
- subjects experiencing severe or unexpected drug-related adverse effects;
- any interruptions or delays in the supply of our product candidates for our clinical trials;
- a facility manufacturing any of our product candidates or any of their components being ordered by the FDA or comparable foreign regulatory authorities to temporarily or permanently shut down due to violations of good manufacturing practice (cGMP) regulations or other applicable requirements, or infections or cross-contaminations of product candidates in the manufacturing process;
- any changes to our manufacturing process or product specifications that may be necessary or desired;
- any failure or delay in reaching an agreement with contract research organizations (CROs) and clinical trial sites;
- third-party clinical investigators losing the licenses or permits necessary to perform our clinical trials, not performing our clinical trials on our anticipated schedule or consistent with the clinical trial protocol, good clinical practices (GCP) or regulatory requirements or other third parties not performing data collection or analysis in a timely or accurate manner;
- third-party contractors becoming debarred or suspended or otherwise penalized by the FDA or other comparable foreign regulatory authorities for violations of applicable regulatory requirements, in which case we may need to find a substitute contractor, and we may not be able to use some or all of the data produced by such contractors in support of our marketing applications;
- one or more Institutional Review Boards (IRBs) refusing to approve, suspending or terminating the trial at an investigational site, precluding enrollment of additional subjects, or withdrawing its approval of the trial; or
- changes in regulatory requirements and policies, which may require us to amend clinical trial protocols to comply with these changes and resubmit our clinical trial protocols to IRBs for reexamination.

Any delays in completing our clinical trials will increase our costs, slow down our product candidate development and approval process and jeopardize the commercial prospects of our product candidates and our ability to commence product sales and generate revenue.

In addition, many of the factors that cause, or lead to, termination or suspension of, or a delay in the commencement or completion of, clinical trials may also ultimately lead to the denial of regulatory approval of a product candidate. For example, if we make manufacturing or formulation changes to our product candidates, we may need to conduct additional studies to bridge our modified product candidates to earlier versions. Further, if one or more clinical trials are delayed, our competitors may be able to bring products to market before we do, and the commercial viability of our product candidates could be significantly reduced. Any of these occurrences may harm our business, financial condition and prospects significantly. Any termination of any clinical trial of our product candidates will harm our commercial prospects and our ability to generate revenue.

We may not be successful in our efforts to identify or discover additional product candidates in the future.

Our research programs may initially show promise in identifying potential product candidates, yet fail to yield product candidates for clinical development for a number of reasons, including:

- our inability to design such product candidates with the pharmacological properties that we desire or attractive pharmacokinetics; or
- potential product candidates may, on further study, be shown to have harmful side effects or other characteristics that indicate that they are unlikely to be medicines that will receive marketing approval and achieve market acceptance.

Research programs to identify new product candidates require substantial technical, financial and human resources. If we are unable to identify suitable compounds for preclinical and clinical development, we will not be able to obtain product revenue in future periods, which likely would result in significant harm to our financial position and adversely impact our stock price.

If we do not achieve our product development goals in the time frames we announce and expect, the commercialization of our product candidates may be delayed and as a result our share price may decline.

Drug development is inherently risky and uncertain. We cannot be certain that we will be able to:

- complete IND-enabling preclinical studies or develop manufacturing processes and associated analytical methods that meet cGMP requirements in time to initiate clinical trials in the timeframes we announce;
- obtain sufficient clinical supply of our product candidates to support our ongoing or planned clinical trials;
- initiate our clinical trials within the timeframes we announce;
- enroll and maintain a sufficient number of subjects to complete any of our clinical trials; or
- analyze the data collected from any completed clinical trials in the timeframes we announce.

The actual timing of our development milestones can vary significantly compared to our estimates, in some cases for reasons beyond our control. If we are unable to achieve our goals within the timeframes we announce, the commercialization of our product candidates may be delayed and, as a result, the stock price of our common stock could fall and our stockholders' may lose all of their investment.

Even if any of our product candidates receive marketing approval, they may fail to achieve the degree of market acceptance by physicians, patients, hospitals, cancer treatment centers, healthcare 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, healthcare payors and others in the medical community. For example, current cancer treatments like chemotherapy and radiation therapy are well established in the medical community, and physicians may continue to rely on these treatments. Most of our product candidates currently target mechanisms for which there are no currently approved products. If our product candidates do not achieve an adequate level of acceptance, we may not generate significant product 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:

- efficacy and potential advantages compared to alternative treatments;
- our ability to offer our medicines for sale at competitive prices;
- convenience and ease of administration compared to alternative treatments;
- the willingness of the target patient population to try new therapies and of physicians to prescribe these therapies;
- the strength of marketing and distribution support;
- sufficient third-party coverage or reimbursement; and
- the prevalence and severity of any side effects.

Risks Related to Manufacturing, Commercialization and Reliance on Third Parties

We rely on third parties to conduct our clinical trials and perform some of our research and preclinical studies. If these third parties do not satisfactorily carry out their contractual duties or fail to meet expected deadlines, our development programs may be delayed or subject to increased costs, each of which may have an adverse effect on our business and prospects.

We do not have the ability to conduct all aspects of our preclinical testing or clinical trials ourselves. As a result, we are and expect to remain dependent on third parties to conduct our ongoing Phase 1 clinical trials and any future clinical trials of our product candidates. The timing of the initiation and completion of these trials will therefore be partially controlled by such third parties and may result in delays to our development programs. Specifically, we expect CROs, clinical investigators, and consultants to play a significant role in the conduct of these trials and the subsequent collection and analysis of data. However, we will not be able to control all aspects of their activities. Nevertheless, we are responsible for ensuring that each of our trials is conducted in accordance with the applicable protocol and legal, regulatory and scientific standards, and our reliance on the CROs and other third parties does not relieve us of our regulatory responsibilities. We and our CROs are required to comply with GCP requirements, which are regulations and guidelines enforced by the FDA, the Competent Authorities of the Member States of the European Economic Area, Australian Therapeutic Goods Administration and comparable foreign regulatory authorities for all of our product candidates in clinical development. Regulatory authorities enforce these GCP requirements through periodic inspections of trial sponsors, clinical trial investigators and clinical trial sites. If we or any of our CROs or clinical trial sites fail to comply with applicable GCP requirements, the data generated in our clinical trials may be deemed unreliable, and the FDA or comparable foreign regulatory authorities may require us to perform additional clinical trials before approving our marketing applications. In addition, our clinical trials must be conducted with product produced under cGMP regulations. Our failure to comply with these regulations may require us to stop and/or repeat clinical trials, which would delay the marketing approval process.

There is no guarantee that any such CROs, clinical trial investigators or other third parties on which we rely will devote adequate time and resources to our development activities or perform as contractually required. If any of these third parties fail to meet expected deadlines, adhere to our clinical protocols or meet regulatory requirements, otherwise performs in a substandard manner, or terminates its engagement with us, the timelines for our development programs may be extended or delayed or our development activities may be suspended or terminated. If any of our clinical trial sites terminates for any reason, we may experience the loss of follow-up information on subjects enrolled in such clinical trials unless we are able to transfer those subjects to another qualified clinical trial site, which may be difficult or impossible. In addition, clinical trial investigators for our clinical trials may serve as scientific advisors or consultants to us from time to time and may receive cash or equity compensation in connection with such services. If these relationships and any related compensation result in perceived or actual conflicts of interest, or the FDA or comparable foreign regulatory authorities concludes that the financial relationship may have affected the interpretation of the trial, the integrity of the data generated at the applicable clinical trial site may be questioned and the utility of the clinical trial itself may be jeopardized, which could result in the delay or rejection of any marketing application we submit by the FDA or any comparable foreign regulatory authority. Any such delay or rejection could prevent us from commercializing our product candidates.

Furthermore, these third parties may also have relationships with other entities, some of which may be our competitors. If these third parties do not successfully carry out their contractual duties, meet expected deadlines or conduct our clinical trials in accordance with regulatory requirements or our stated protocols, we will not be able to obtain, or may be delayed in obtaining, marketing approvals for our product candidates and will not be able to, or may be delayed in our efforts to, successfully commercialize our products.

We contract with third parties for the manufacturing and supply of product candidates for use in preclinical testing and clinical trials, which supply may become limited or interrupted or may not be of satisfactory quality and quantity.

We do not have any manufacturing facilities. We produce in our laboratory relatively small quantities of compounds for evaluation in our research programs. We rely, and expect to continue to rely, on third parties for the manufacture of our product candidates for preclinical and clinical testing, as well as for commercial manufacture if any of our product candidates are approved. We currently have limited manufacturing arrangements and expect that each of our product candidates will only be covered by single source suppliers for the foreseeable future. This reliance increases the risk that we will not have sufficient quantities of our product candidates or products, if approved, or such quantities at an acceptable cost or quality, which could delay, prevent or impair our development or commercialization efforts.

Furthermore, all entities involved in the preparation of therapeutics for clinical trials or commercial sale, including our existing contract manufacturers for our product candidates, are subject to extensive regulation. Components of a finished therapeutic product approved for commercial sale or used in clinical trials must be manufactured in accordance with cGMP requirements. These regulations govern manufacturing processes and procedures, including record keeping, and the implementation and operation of quality systems to control and assure the quality of investigational products and products approved for sale. Poor control of production processes can lead to the introduction of contaminants, or to inadvertent changes in the properties or stability of our product candidates that may not be detectable in final product testing. We or our contract manufacturers must supply all necessary documentation in support of a New Drug Application (NDA) or Biologics Licens e Application (BLA) on a timely basis and must adhere to the FDA's Good Laboratory Practice regulations and cGMP regulations enforced by the FDA through its facilities inspection program. Comparable foreign regulatory authorities may require compliance with similar requirements. The facilities and quality systems of our third-party contractor manufacturers must pass a pre-approval inspection for compliance with the applicable regulations as a condition of marketing approval of our product candidates. We do not control the manufacturing process of, and are completely dependent on, our contract manufacturing partners for compliance with cGMP regulations.

In the event that any of our manufacturers fails to comply with such requirements or to perform its obligations to us in relation to quality, timing or otherwise, or if our supply of components or other materials becomes limited or interrupted for other reasons, we may be forced to manufacture the materials ourselves, for which we currently do not have the capabilities or resources, or enter into an agreement with another third party, which we may not be able to do on commercially reasonable terms, if at all. In particular, any replacement of our manufacturers could require significant effort and expertise because there may be a limited number of qualified replacements. In some cases, the technical skills or technology required to manufacture our product candidates may be unique or proprietary to the original manufacturer and we may have difficulty transferring such skills or technology to another third party and a feasible alternative may not exist. These factors would increase our reliance on such manufacturer or require us to obtain a license from such manufacturer in order to have another third party manufacture our product candidates. If we are required to change manufacturers for any reason, we will be required to verify that the new manufacturer maintains facilities and procedures that comply with quality standards and with all applicable regulations and guidelines. The delays associated with the verification of a new manufacturer could negatively affect our ability to develop product candidates in a timely manner or within budget. Our or a third party's failure to execute on our manufacturing requirements, to do so on commercially reasonable terms and comply with cGMP could adversely affect our business in a number of ways, including:

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

We, or our third-party manufacturers, may be unable to successfully scale-up manufacturing of our product candidates in sufficient quality and quantity, which would delay or prevent us from conducting clinical trials and developing our product candidates.

In order to conduct clinical trials of our product candidates, we will need to manufacture them in large quantities. We, or our manufacturing partners, may be unable to successfully increase the manufacturing capacity for any of our product candidates in a timely or cost-effective manner, or at all. In addition, quality issues may arise during scale-up activities. If we or our manufacturing partners are unable to successfully scale up the manufacture of our product candidates in sufficient quality and quantity, the development, testing and clinical trials of that product candidate may be delayed or become infeasible, and marketing approval or commercial launch of any resulting product may be delayed or not obtained, which could significantly harm our business.

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

As product candidates progress through preclinical to late stage clinical trials to marketing approval and commercialization, it is common that various aspects of the development program, such as the product candidate's specifications, manufacturing methods and formulation, are altered along the way in an effort to optimize yield, manufacturing batch size, minimize costs and achieve consistent quality and results. 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 altered materials. 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 commercialize our product candidates and generate revenue.

The manufacture of biologics is complex and our third-party manufacturers may encounter difficulties in production. If any of our third-party manufacturers encounter such difficulties, our ability to provide supply of our product candidates for clinical trials or our products for patients, if approved, could be delayed or prevented.

Manufacturing biologics, especially in large quantities, is often complex and may require the use of innovative technologies to handle living cells. Each lot of an approved biologic must undergo thorough testing for identity, strength, quality, purity and potency. Manufacturing biologics requires facilities specifically designed for and validated for this purpose, and sophisticated quality assurance and quality control procedures are necessary. Slight deviations anywhere in the manufacturing process, including filling, labeling, packaging, storage and shipping and quality control and testing, may result in lot failures, product recalls or spoilage. When changes are made to the manufacturing process, we may be required to provide preclinical and clinical data showing the comparable identity, strength, quality, purity or potency of the products before and after such changes. If microbial, viral or other contaminations are discovered at the facilities of our manufacturer, such facilities may need to be closed for an extended period of time to investigate and remedy the contamination, which could delay clinical trials and adversely harm our business. The use of biologically derived ingredients can also lead to allegations of harm, including infections or allergic reactions, or closure of product facilities due to possible contamination.

In addition, there are risks associated with large scale manufacturing for clinical trials or commercial scale including, among others, cost overruns, potential problems with process scale-up, process reproducibility, stability issues, compliance with good manufacturing practices, lot consistency and timely availability of raw materials. Even if we obtain marketing approval for any of our product candidates, there is no assurance that our manufacturers will be able to manufacture the approved product to specifications acceptable to the FDA or other comparable foreign regulatory authorities, to produce it in sufficient quantities to meet the requirements for the potential commercial launch of the product or to meet potential future demand. If our manufacturers are unable to produce sufficient quantities for clinical trials or for commercialization, our development and commercialization efforts would be impaired, which would have an adverse effect on our business, financial condition, results of operations and growth prospects.

Any product candidates for which we intend to seek approval as biologic products may face competition sooner than anticipated.

The Biologics Price Competition and Innovation Act of 2009 (BPCIA) created an abbreviated approval pathway for biological products that are biosimilar to or interchangeable with an FDA-licensed reference biological product. 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 twelve years from the date on which the reference product was first licensed. During this twelve-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 the sponsor's own preclinical data and data from adequate and well-controlled clinical trials to demonstrate the safety, purity and potency of its product. The law is complex and is still being interpreted and implemented by the FDA. As a result, any such processes could have a material adverse effect on the future commercial prospects for our biological products.

AB122 and AB154 are biological products and we may develop additional biological products in the future. We believe that any of our current and future product candidates approved as a biological product under a BLA should qualify for the twelve-year period of exclusivity. However, there is a risk that this exclusivity could be shortened due to Congressional action or otherwise, or that the FDA will not consider our product candidates to be reference products for competing products, potentially creating the opportunity for biosimilar competition sooner than anticipated. Other aspects of the BPCIA, some of which may impact the BPCIA exclusivity provisions, have also been the subject of recent litigation. Moreover, the extent to which a biosimilar, once approved, could be substituted for any one of our reference products in a way that is similar to traditional generic substitution for non-biological products will depend on a number of marketplace and regulatory factors that are still developing.

Even if we receive marketing approval, we may not be able to successfully commercialize our product candidates due to unfavorable pricing regulations or third-party coverage and reimbursement policies, which could make it difficult for us to sell our product candidates profitably.

Obtaining coverage and reimbursement approval for a product from a government or other third-party payor is a time-consuming and costly process that could require us to provide supporting scientific, clinical and cost effectiveness data for the use of our products to the payor. There may be significant delays in obtaining such coverage and reimbursement for newly approved products, and coverage may be more limited than the purposes for which the product is approved by the FDA or comparable foreign regulatory authorities. Moreover, eligibility for coverage and reimbursement does not imply that a product will be paid for in all cases or at a rate that covers our costs, including research, development, intellectual property, manufacture, sale and distribution expenses. Interim reimbursement levels for new products, if applicable, may also not be sufficient to cover our costs and may not be made permanent. Reimbursement rates may vary according to the use of the product and the clinical setting in which it is used, may be based on reimbursement levels already set for lower cost products and may be incorporated into existing payments for other services. Net prices for products may be reduced by mandatory discounts or rebates required by government healthcare programs or private payors, by any future laws limiting drug prices and by any future relaxation of laws that presently restrict imports of product from countries where they may be sold at lower prices than in the United States.

There is significant uncertainty related to the insurance coverage and reimbursement of newly approved products. Third-party payors often rely upon Medicare coverage policy and payment limitations in setting reimbursement policies, but also have their own methods and approval process apart from Medicare coverage and reimbursement determinations.

Coverage and reimbursement by a third-party payor may depend upon a number of factors, including the third-party payor's determination that use of a product is:

- a covered benefit under its health plan;
- safe, effective and medically necessary;
- appropriate for the specific patient;
- cost-effective; and
- neither experimental nor investigational.

We cannot be sure that reimbursement will be available for any product that we commercialize and, if coverage and reimbursement are available, what the level of reimbursement will be. Obtaining reimbursement for our products may be particularly difficult because of the higher prices often associated with branded therapeutics and therapeutics administered under the supervision of a physician. Our inability to promptly obtain coverage and adequate reimbursement rates from both government-funded and private payors for any approved products that we develop could have a material adverse effect on our operating results, our ability to raise capital needed to commercialize products and our overall financial condition.

Reimbursement may impact the demand for, and the price of, any product for which we obtain marketing approval. Assuming we obtain coverage for a given product by a third-party payor, the resulting reimbursement payment rates may not be adequate or may require co-payments that patients find unacceptably high. Patients who are prescribed medications for the treatment of their conditions, and their prescribing physicians, generally rely on third-party payors to reimburse all or part of the costs associated with those medications. Patients are unlikely to use our products unless coverage is provided and reimbursement is adequate to cover all or a significant portion of the cost of our products. Therefore, coverage and adequate reimbursement is critical to new product acceptance. Coverage decisions may depend upon clinical and economic standards that disfavor new products when more established or lower cost therapeutic alternatives are already available or subsequently become available.

We expect to experience pricing pressures in connection with the sale of any of our product candidates due to the trend toward managed healthcare, the increasing influence of health maintenance organizations, and additional legislative changes. The downward pressure on healthcare costs in general, particularly prescription medicines, medical devices and surgical procedures and other treatments, has become very intense. As a result, increasingly high barriers are being erected to the successful commercialization of new products. Further, the adoption and implementation of any future governmental cost containment or other health reform initiative may result in additional downward pressure on the price that we may receive for any approved product.

Outside the United States, many countries require approval of the sale price of a product before it can be marketed and the pricing review period only begins after marketing or product licensing approval is granted. To obtain reimbursement or pricing approval in some of these countries, we may be required to conduct a clinical trial that compares the cost-effectiveness of our product candidate to other available therapies. In some foreign markets, prescription pharmaceutical pricing remains subject to continuing governmental control even after initial approval is granted. As a result, we might obtain marketing approval for a product candidate in a particular country, but then be subject to price regulations that delay our commercial launch of the product, possibly for lengthy time periods, and negatively impact the revenue, if any, we are able to generate from the sale of the product in that country. Adverse pricing limitations may hinder our ability to recoup our investment in one or more product candidates, even if such product candidates obtain marketing approval.

If the market opportunities for any product that we or our strategic partners develop are smaller than we believe they are, our revenue may be adversely affected and our business may suffer.

We are focused on the development of treatments for cancer. Our projections of addressable patient populations that have the potential to benefit from treatment with our product candidates are based on estimates. If any of our estimates are inaccurate, the market opportunities for any of our product candidates could be significantly diminished and have an adverse material impact on our business.

Our employees, clinical trial investigators, CROs, consultants, vendors and any potential commercial partners may engage in misconduct or other improper activities, including non-compliance with regulatory standards and requirements and insider trading.

We are exposed to the risk of fraud or other misconduct by our employees, clinical trial investigators, CROs, consultants, vendors and any potential commercial partners. Misconduct by these parties could include intentional, reckless and/or negligent conduct or disclosure of unauthorized activities to us that violates: (i) FDA laws and regulations or those of comparable foreign regulatory authorities, including those laws that require the reporting of true, complete and accurate information, (ii) manufacturing standards, (iii) federal and state health and data privacy, security, fraud and abuse, government price reporting, transparency reporting requirements, and other healthcare laws and regulations in the United States and abroad, or (iv) laws that require the true, complete and accurate reporting of financial information or data. Such misconduct could also involve the improper use of information obtained in the course of clinical trials, which could result in regulatory sanctions and cause serious harm to our reputation. We have adopted a code of conduct applicable to all of our employees, as well as a disclosure program and other applicable policies and procedures, but it is not always possible to identify and deter employee 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 comply with these 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 fines or other sanctions.

Our 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.

Because we rely on third parties to research and develop and to manufacture our product candidates, we must share trade secrets with them. 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 independent discovery of our trade secrets or other unauthorized use or disclosure would impair our competitive position and may have a material adverse effect on our business.

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, although our agreements may contain certain limited publication rights. For example, any academic institution that we may collaborate with will likely expect to be granted rights to publish data arising out of such collaboration and any joint research and development programs may require us to share trade secrets under the terms of our research and development or similar agreements. Despite our efforts to protect our trade secrets, our competitors may discover our trade secrets, either through breach of our agreements with third parties, independent development or publication of information by any of our third-party collaborators. A competitor's discovery of our trade secrets would impair our competitive position and have an adverse impact on our business.

If we are unable to establish sales and marketing capabilities or enter into agreements with third parties to sell and market our product candidates, we will be unable to successfully commercialize our product candidates if and when they are approved.

We have no sales, marketing or distribution capabilities or experience. To achieve commercial success for any approved product for which we retain sales and marketing responsibilities, we must either develop a sales and marketing organization, which would be expensive and time consuming, or outsource these functions to other third parties. In the future, we may choose to build a focused sales and marketing infrastructure to sell, or participate in sales activities with our collaborators for, some of our product candidates if and when they are approved.

There are risks involved with both establishing our own sales and marketing capabilities and entering into arrangements with third parties to perform these services. 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 commercialize our medicines on our own include:

- our inability to recruit and retain adequate numbers of effective sales and marketing personnel;
- the inability of sales personnel to obtain access to physicians or persuade adequate numbers of physicians to prescribe any future medicines;
- the lack of complementary medicines 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 enter into arrangements with third parties to perform sales, marketing and distribution services, our product revenue or the profitability of these product revenue to us are likely to be lower than if we were to market and sell any medicines that we develop ourselves. In addition, we may not be successful in entering into arrangements with third parties to sell and market our product candidates or may be unable to do so on terms that are favorable to us. In entering into third-party marketing or distribution arrangements, any revenue we receive will depend upon the efforts of the third parties, and we cannot assure you that such third parties will establish adequate sales and distribution capabilities or devote the necessary resources and attention to sell and market our medicines effectively. If we do not establish sales and marketing capabilities successfully, either on our own or in collaboration with third parties, we will not be successful in commercializing our product candidates.

Even if we obtain FDA approval of any of our product candidates, we may never obtain approval or commercialize such products outside the United States, which would limit our ability to realize their full market potential.

In order to market any products outside the United States, we must establish and comply with numerous and varying regulatory requirements of other countries regarding safety and efficacy. Clinical trials conducted in one country may not be accepted by regulatory authorities in other countries, and regulatory approval in one country does not mean that regulatory approval will be obtained in any other country. Approval procedures vary among countries and can involve additional product testing and validation and additional administrative review periods. Seeking foreign regulatory approvals could result in significant delays, difficulties and costs for us and may require additional preclinical studies or clinical trials which would be costly and time consuming. Regulatory requirements can vary widely from country to country and could delay or prevent the introduction of our products in those countries. Satisfying these and other regulatory requirements is costly, time consuming, uncertain and subject to unanticipated delays. In addition, our failure to obtain regulatory approval in any country may delay or have negative effects on the process for regulatory approval in other countries. We do not have any product candidates approved for sale in any jurisdiction, including international markets, and we do not have experience in obtaining regulatory approval in international markets. If we fail to comply with regulatory requirements in international markets or to obtain and maintain required approvals, our ability to realize the full market potential of our products will be harmed.

Risks Related to our In-Licenses and Other Strategic Agreements

We are currently party to several in-license agreements under which we acquired rights to use, develop, manufacture and/or commercialize certain of our product candidates. If we breach our obligations under these agreements, we may be required to pay damages, lose our rights to these product candidates or both, which would adversely affect our business and prospects.

We rely, in part, on license and other strategic agreements, which subject us to various obligations, including diligence obligations with respect to development and commercialization activities, payment obligations for achievement of certain milestones and royalties on product sales, negative covenants and other material obligations. If we fail to comply with the obligations under our license agreements or use the intellectual property licensed to us in an unauthorized manner, we may be required to pay damages and our licensors may have the right to terminate the license. If our license agreements are terminated, we may not be able to develop, manufacture, market or sell the products covered by our agreements and those being tested or approved in combination with such products. Such an occurrence could materially adversely affect the value of the product candidate being developed under any such agreement and any other product candidates being developed or tested in combination. For example, we intend to test many of our small-molecule product candidates with AB122, which we in-licensed from WuXi Biologics. In the event we breach our license agreement with WuXi Biologics, and WuXi Biologics terminates our license agreement, we would be unable to test those combinations, or we would have to negotiate a new or reinstated agreement, which may not be available to us on equally favorable terms, or at all.

In addition, the agreements under which we license intellectual property or technology to or from third parties are complex, and certain provisions in such agreements may be susceptible to multiple interpretations. The resolution of any contract interpretation disagreement that may arise could narrow what we believe to be the scope of our rights to the relevant intellectual property or technology, or increase what we believe to be our financial or other obligations under the relevant agreement, either of which could have a material adverse effect on our business, financial condition, results of operations and prospects. Moreover, if disputes over intellectual property that we have licensed prevent or impair our ability to maintain our current licensing arrangements on commercially acceptable terms, we may be unable to successfully develop and commercialize the affected product candidates.

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 research program or product candidate and our business, financial condition, results of operations and prospects could suffer.

We may not realize the benefits of any acquisitions, in-license or other collaborations or strategic alliances that we enter into.

We have entered into in-license agreements with multiple licensors and an option agreement to out-license certain of our product candidates in select markets and in the future may seek and form strategic alliances, create joint ventures or collaborations, or enter into acquisitions or additional licensing arrangements with third parties that we believe will complement or augment our development and commercialization efforts with respect to our product candidates and any future product candidates that we may develop.

These transactions can entail numerous operational and financial risks, including exposure to unknown liabilities, disruption of our business and diversion of our management's time and attention in order to manage a collaboration or develop acquired products, product candidates or technologies, incurrence of substantial debt or dilutive issuances of equity securities to pay transaction consideration or costs, higher than expected collaboration, acquisition or integration costs, write-downs of assets or goodwill or impairment charges, increased amortization expenses, difficulty and cost in facilitating the collaboration or combining the operations and personnel of any acquired business, impairment of relationships with key suppliers, manufacturers or customers of any acquired business due to changes in management and ownership and the inability to retain key employees of any acquired business. As a result, if we enter into collaboration agreements, strategic partnerships or license our products, we may not be able to realize the benefit of such transactions if we are unable to successfully integrate them with our existing operations and company culture, which could delay our timelines or otherwise adversely affect our business.

We also cannot be certain that, following a strategic transaction or license, we will achieve the revenue or specific net income that justifies such transaction or such other benefits that led us to enter into the arrangement. For example, the Taiho Agreement provides us with non-dilutive capital to fund our operations and a strategic development and commercialization partner for our product candidates in Japan and certain other territories in Asia (excluding China). If Taiho does not exercise its option to develop a program, our capital requirements relating to that development program will significantly increase and we may need to seek a new partner in order to develop and commercialize our product candidates from that program in the territories optioned by Taiho. Failure to realize the benefits of any collaborations or strategic alliances may further cause us to curtail the development of a 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 planned sales or marketing activities, or increase our expenditures and undertake development or commercialization activities at our own expense. If we elect to fund and undertake development or commercialization activities on our own, we will need to obtain additional expertise and additional capital, which may not be available to us on acceptable terms or at all. If we fail to enter into collaborations and do not have sufficient funds or expertise to undertake the necessary development and commercialization activities, we may not be able to further develop our product candidates or bring them to market and generate product sales revenue, which would harm our business prospects, financial condition and results of operations.

We may wish to acquire rights to future assets through in-licensing or may attempt to form collaborations in the future with respect to our product candidates, but may not be able to do so, which may cause us to alter or delay our development and commercialization plans.

The development and potential commercialization of our product candidates will require substantial additional capital to fund expenses. We have entered into an option and license agreement with Taiho for the potential development and commercialization of our product candidates in Japan and certain other territories in Asia (excluding China). We may, in the future, decide to collaborate with other biopharmaceutical companies for the development and potential commercialization of those product candidates in other countries or territories of the world. We will face significant competition in seeking appropriate collaborators. We may not be successful in our efforts to establish a strategic partnership or other alternative arrangements for our product candidates because they may be deemed to be at too early of a stage of development for collaborative effort and third parties may not view our product candidates as having the requisite potential to demonstrate safety and efficacy. If and when we collaborate with a third party for development and commercialization of a product candidate, we can expect to relinquish some or all of the control over the future success of that product candidate to the third party. Our ability to reach a definitive agreement for a 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 following:

- the design or results of clinical trials;
- the likelihood of approval by the FDA or comparable foreign regulatory authorities;
- the potential market for the 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 or other rights, 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. We may also be restricted under any license agreements from entering into agreements on certain terms or at all with potential collaborators. 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 and changes to the strategies of the combined company. As a result, we may not be able to negotiate 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 one or more of our other development programs, delay the potential commercialization or reduce the scope of any planned sales or marketing activities for such product candidate, or increase our expenditures and undertake development, manufacturing or commercialization activities at our own expense. If we elect to increase our expenditures to fund development, manufacturing 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 product revenue.

Managing our obligations under our in-license agreements and our option agreement may divert management time and attention, causing delays or disruptions to our business.

We have entered into and may in the future enter into in-license agreements with multiple licensors and a strategic option agreement, which subject us to various obligations, including diligence obligations, reporting and notification obligations, payment obligations for achievement of certain milestone as well as other material obligations. We may need to devote substantial time and attention to ensuring that we successfully integrate these transactions into our existing operations and are compliant with our obligations under these agreements, which may divert management's time and attention away from our research and development programs or other day-to-day activities.

Our in-license and strategic agreements are also complex and certain provisions in those agreements may be susceptible to multiple interpretations. In the event of any disagreement about the interpretation of these provisions, our management may need to devote a disproportionate amount of its attention to resolving these disagreements. Such disruptions may cause delays in our research and development programs and other business objectives.

Our operating activities may be restricted by certain covenants in our license and other strategic agreements, which could limit our development and commercial opportunities.

In connection with certain of our acquisitions, in-license or other collaborations or strategic alliances, we may agree to and be bound by negative covenants which may limit our development and commercial opportunities. For example, pursuant to our in-license of anti-PD-1 antibodies from WuXi Biologics, we made certain covenants to not commercialize any anti-PD-1 antibody licensed or obtained by us after the date of the license agreement with WuXi Biologics other than anti-PD-1 antibodies licensed from WuXi Biologics, subject to certain exceptions as set forth in our license agreement with WuXi Biologics. Furthermore, we agreed in our license agreement that WuXi Biologics would be our exclusive manufacturer of anti-PD-1 antibodies licensed thereunder until a certain number of years has elapsed following commercialization of such an anti-PD-1 antibody and that we would utilize WuXi Biologics as our exclusive provider of CMC development services for our biologic product candidates for three years from the date of our license agreement, subject to certain exceptions in each case. These exclusivity provisions may inhibit our development efforts, prevent us from forming strategic collaborations to develop and potentially commercialize any other anti-PD-1 antibody product candidates and may materially harm our business, financial condition, results of operations and prospects.

Risks Related to Intellectual Property

If we are unable to obtain and maintain sufficient intellectual property protection for our product candidates, or if the scope of the intellectual property protection is not sufficiently broad, our competitors could develop and commercialize products similar or identical to ours, and our ability to successfully commercialize our products may be adversely affected.

Our success depends in large part on our ability to obtain and maintain patent protection in the United States and other countries with respect to our product candidates and research programs. We seek to protect our proprietary position by filing patent applications in the United States and abroad related to our novel discoveries and technologies that are important to our business. Our pending and future patent applications may not result in patents being issued which protect our product candidates or their intended uses or which effectively prevent others from commercializing competitive technologies, products or product candidates.

Obtaining and enforcing patents is expensive and time-consuming, and we may not be able to file and prosecute all necessary or desirable patent applications, or maintain and/or enforce patents that may issue based on our patent applications, at a reasonable cost or in a timely manner. It is also possible that we will fail to identify patentable aspects of our research and development results before it is too late to obtain patent protection. Although we enter into non-disclosure and confidentiality agreements with parties who have access to patentable aspects of our research and development output, such as our employees, corporate collaborators, outside scientific collaborators, contract research organizations, contract manufacturers, consultants, advisors and other third parties, any of these parties may breach these agreements and disclose such results before a patent application is filed, thereby jeopardizing our ability to seek patent protection.

The patent position of biopharmaceutical companies generally is highly uncertain, involves complex legal and factual questions and has in recent years been the subject of much litigation, resulting in court decisions, including Supreme Court decisions, that have increased uncertainties as to the ability to enforce patent rights in the future. In addition, the laws of foreign countries may not protect our rights to the same extent as the laws of the United States, or vice versa.

Further, we may not be aware of all third-party intellectual property rights potentially relating to our product candidates or their intended uses, and as a result the impact of such third-party intellectual property rights upon the patentability of our own patents and patent applications, as well as the impact of such third-party intellectual property upon our freedom to operate, is highly uncertain. Patent applications in the United States and other jurisdictions are typically not published until 18 months after filing or, in some cases, not at all. Therefore, we cannot know with certainty whether we were the first to make the inventions claimed in our patents or pending patent applications, or that we were the first to file for patent protection of such inventions. As a result, the issuance, scope, validity, enforceability and commercial value of our patent rights are highly uncertain. Our patents or pending patent applications may be challenged in the courts or patent offices in the United States and abroad. For example, we may be subject to a third party pre-issuance submission of prior art to the U.S. Patent and Trademark Office, or become involved in post-grant review procedures, oppositions, derivations, reexaminations, or inter partes review proceedings, in the United States or elsewhere, challenging our patent rights or the patent rights of others. An adverse determination in any such challenges may result in loss of exclusivity or in patent claims being narrowed, invalidated, or held unenforceable, in whole or in part, which could limit our ability to stop others from using or commercializing similar or identical technology and products, or limit the duration of the patent protection of our technology and products. In addition, 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.

We may not identify relevant third-party patents or may incorrectly interpret the relevance, scope or expiration of a third party patent which might adversely affect our ability to develop and market our products.

We cannot guarantee that any of our patent searches or analyses, including the identification of relevant patents, the scope of patent claims or the expiration of relevant patents, are complete or thorough, nor can we be certain that we have identified each and every third party patent and pending application in the United States and abroad that is relevant to or necessary for the commercialization of our product candidates in any jurisdiction.

The scope of a patent claim is determined by an interpretation of the law, the written disclosure in a patent and the patent's prosecution history. Our interpretation of the relevance or the scope of a patent or a pending application may be incorrect, which may negatively impact our ability to market our products. We may incorrectly determine that our products are not covered by a third party patent or may incorrectly predict whether a third party's pending application will issue with claims of relevant scope. Our determination of the expiration date of any patent in the United States or abroad that we consider relevant may be incorrect, which may negatively impact our ability to develop and market our product candidates. Our failure to identify and correctly interpret relevant patents may negatively impact our ability to develop and market our products.

In the future, we may need to obtain additional licenses of third-party technology that may not be available to us or are available only on commercially unreasonable terms, and which may cause us to operate our business in a more costly or otherwise adverse manner that was not anticipated.

From time to time we may be required to license technology from additional third parties to further develop or commercialize our product candidates. Should we be required to obtain licenses to any third-party technology, including any such patents required to manufacture, use or sell our product candidates, such licenses may not be available to us on commercially reasonable terms, or at all. The inability to obtain any third-party license required to develop or commercialize any of our product candidates could cause us to abandon any related efforts, which could seriously harm our business and operations.

We cannot ensure that patent rights relating to inventions described and claimed in our pending patent applications will issue or that patents based on our patent applications will not be challenged and rendered invalid and/or unenforceable.

We have pending U.S. and foreign patent applications in our portfolio, however, we cannot predict:

- if and when patents may issue based on our patent applications;
- the scope of protection of any patent issuing based on our patent applications;
- whether the claims of any patent issuing based on our patent applications will provide protection against competitors,
- whether or not third parties will find ways to invalidate or circumvent our patent rights;

- whether or not others will obtain patents claiming aspects similar to those covered by our patents and patent applications;
- whether we will need to initiate litigation or administrative proceedings to enforce and/or defend our patent rights which will be costly whether we win or lose; and/or
- whether the patent applications that we own or in-license will result in issued patents with claims that cover our product candidates or uses thereof in the United States or in other foreign countries.

We cannot be certain that the claims in our pending patent applications directed to our product candidates and/or technologies will be considered patentable by the U.S. Patent and Trademark Office (USPTO) or by patent offices in foreign countries. One aspect of the determination of patentability of our inventions depends on the scope and content of the "prior art," information that was or is deemed available to a person of skill in the relevant art prior to the priority date of the claimed invention. There may be prior art of which we are not aware that may affect the patentability of our patent claims or, if issued, affect the validity or enforceability of a patent claim. Even if the patents do issue based on our patent applications, third parties may challenge the validity, enforceability or scope thereof, which may result in such patents being narrowed, invalidated or held unenforceable. Furthermore, even if they are unchallenged, patents in our portfolio may not adequately exclude third parties from practicing relevant technology or prevent others from designing around our claims. If the breadth or strength of our intellectual property position with respect to our product candidates is threatened, it could dissuade companies from collaborating with us to develop and threaten our ability to commercialize our product candidates. In the event of litigation or administrative proceedings, we cannot be certain that the claims in any of our issued patents will be considered valid by courts in the United States or foreign countries.

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

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

- others may be able to make product candidates that are similar to ours but that are not covered by the claims of the patents that we own or have exclusively licensed;
- we or our licensors or future collaborators might not have been the first to make the inventions covered by the issued patent or pending patent application that we own or have exclusively licensed;
- we or our licensors 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 have exclusively licensed may be held invalid or unenforceable, as a result of legal challenges by our competitors;
- our competitors might conduct research and development activities in countries where we do not have patent rights and then use the information learned from such activities to develop competitive products for sale in our major commercial markets;
- we may not develop additional proprietary technologies that are patentable; and
- the patents of others may have an adverse effect on our business.

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

If we are sued for infringing intellectual property rights of third parties, such litigation could be costly and time consuming and could prevent or delay us from developing or commercializing our product candidates.

Our commercial success depends, in part, on our ability to develop, manufacture, market and sell our product candidates without infringing the intellectual property and other proprietary rights of third parties. Third parties may allege that we have infringed or misappropriated their intellectual property. Litigation or other legal proceedings relating to intellectual property claims, with or without merit, is unpredictable and generally expensive and time consuming and, even if resolved in our favor, is likely to divert significant resources from our core business, including distracting our technical and management personnel from their normal responsibilities. In addition, there could be public announcements of the results of hearings, motions or other interim proceedings or developments and if securities analysts or investors perceive these results to be negative, it could have a substantial adverse effect on the market price of our common stock. Such litigation or proceedings could substantially increase our operating losses and reduce the resources available for development activities or any future sales, marketing or distribution activities. We may not have sufficient financial or other resources to adequately conduct such litigation or proceedings. Some of our competitors may be able to sustain the costs of such litigation or proceedings more effectively than we can because of their greater financial resources and more mature and developed intellectual property portfolios. Uncertainties resulting from the initiation and continuation of patent litigation or other proceedings could have a material adverse effect on our ability to compete in the marketplace.

There is a substantial amount of intellectual property litigation in the biotechnology and pharmaceutical industries, and we may become party to, or threatened with, litigation or other adversarial proceedings regarding intellectual property rights with respect to our products candidates. Third parties may assert infringement claims against us based on existing or future intellectual property rights. For example, we are aware of certain patents owned or exclusively licensed by Bristol-Myers Squibb (BMS) having claims directed broadly to treating cancer with anti-PD-1 antibodies (the BMS Patents), which expire in 2023 and 2024. The BMS Patents are currently the subject of litigation between BMS and several other parties. If the validity of the BMS Patents is upheld following all such challenges, and if we receive regulatory approval for AB122 prior to expiration of the BMS Patents, then we may need to delay our commercialization of AB122 or we may need to obtain a license from BMS, which license may not be available on commercially reasonable terms, or at all. The pharmaceutical and biotechnology industries have produced a significant number of patents, and it may not always be clear to industry participants, including us, which patents cover various types of products or methods of use. The coverage of patents is subject to interpretation by the courts, and the interpretation is not always uniform. If we were sued for patent infringement, we would need to demonstrate that our product candidates, products or methods either do not infringe the patent claims of the relevant patent or that the patent claims are invalid or unenforceable, and we may not be able to do this. Proving invalidity may be difficult. For example, in the United States, proving invalidity in court requires a showing of clear and convincing evidence to overcome the presumption of validity enjoyed by issued patents. Even if we are successful in these proceedings, we may incur substantial costs and the time and attention of our management and scientific personnel could be diverted in pursuing these proceedings, which could have a material adverse effect on our business and operations. In addition, we may not have sufficient resources to bring these actions to a successful conclusion. If we are found to infringe a third party's intellectual property rights, we could be forced, including by court order, to cease developing, manufacturing or commercializing the infringing product candidate or product. Alternatively, we may be required to obtain a license from such third party in order to use the infringing technology and continue developing, manufacturing or marketing the infringing product candidate. However, we may not be able to obtain any required license on commercially reasonable terms or at all. Even if we were able to obtain a license, it could be non-exclusive, thereby giving our competitors access to the same technologies licensed to us. In addition, we could be found liable for monetary damages, including treble damages and attorneys' fees if we are found to have willfully infringed a patent. A finding of infringement could prevent us from commercializing our product candidates or force us to cease some of our business operations, which could materially harm our business. Claims that we have misappropriated the confidential information or trade secrets of third parties could have a similar negative impact on our business.

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

Competitors may infringe our patents, trademarks, copyrights or other intellectual property. To counter infringement or unauthorized use, we may be required to file infringement claims, which can be expensive and time consuming and divert the time and attention of our management and scientific personnel. Any claims we assert against perceived infringers could provoke these parties to assert counterclaims against us alleging that we infringe their patents, in addition to counterclaims asserting that our patents are invalid or unenforceable, or both. In any patent infringement proceeding, there is a risk that a court will decide that a patent of ours is invalid or unenforceable, in whole or in part, and that we do not have the right to stop the other party from using the invention at issue. There is also a risk that, even if the validity of such patents is upheld, the court will construe the patent's claims narrowly or decide that we do not have the right to stop the other party from using the invention at issue on the grounds that our patent claims do not cover the invention. An adverse outcome in a litigation or proceeding involving our patents could limit our ability to assert our patents against those parties or other competitors, and may curtail or preclude our ability to exclude third parties from making and selling similar or competitive products. Any of these occurrences could adversely affect our competitive business position, business prospects and financial condition. Similarly, if we assert trademark infringement claims, a court may determine that the marks we have asserted are invalid or unenforceable, or that the party against whom we have asserted trademark infringement has superior rights to the marks in question. In this case, we could ultimately be forced to cease use of such trademarks.

Even if we establish infringement, the court may decide not to grant an injunction against further infringing activity and instead award only monetary damages, which may or may not be an adequate remedy. 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 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 shares of our common stock. Moreover, we cannot assure you that we will have sufficient financial or other resources to file and pursue such infringement claims, which typically last for years before they are concluded. Even if we ultimately prevail in such claims, the monetary cost of such litigation and the diversion of the attention of our management and scientific personnel could outweigh any benefit we receive as a result of the proceedings.

Because of the expense and uncertainty of litigation, we may not be in a position to enforce our intellectual property rights against third parties.

Because of the expense and uncertainty of litigation, we may conclude that even if a third party is infringing our issued patent, any patents that may be issued as a result of our pending or future patent applications or other intellectual property rights, the risk-adjusted cost of bringing and enforcing such a claim or action may be too high or not in the best interest of our company or our stockholders. In such cases, we may decide that the more prudent course of action is to simply monitor the situation or initiate or seek some other non-litigious action or solution.

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

We could in the future be subject to claims that we or our employees have inadvertently or otherwise used or disclosed alleged trade secrets or other confidential information of former employers or competitors. Although we try to ensure that our employees and consultants do not use the intellectual property, proprietary information, know-how or trade secrets of others in their work for us, we may become subject to claims that we caused an employee to breach the terms of his or her non-competition or non-solicitation agreement, or that we or these individuals have, inadvertently or otherwise, used or disclosed the alleged trade secrets or other proprietary information of a former employer or competitor.

While we may litigate to defend ourselves against these claims, even if we are successful, litigation could result in substantial costs and could be a distraction to management. If our defenses to these claims fail, in addition to requiring us to pay monetary damages, a court could prohibit us from using technologies or features that are essential to our product candidates, if such technologies or features are found to incorporate or be derived from the trade secrets or other proprietary information of the former employers. Moreover, any such litigation or the threat thereof may adversely affect our reputation, our ability to form strategic alliances or sublicense our rights to collaborators, engage with scientific advisors or hire employees or consultants, each of which would have an adverse effect on our business, results of operations and financial condition.

We may not be able to protect our intellectual property rights throughout the world.

Patents are of national or regional effect, and filing, prosecuting and defending patents on all of our product candidates throughout the world would be prohibitively expensive. As such, we may not be able to prevent third parties from practicing our inventions in all countries outside the United States, or from selling or importing products made using our inventions in and into the United States or other jurisdictions. Further, the legal systems of certain countries, particularly certain developing countries, do not favor the enforcement of patents and other intellectual property protection, particularly those relating to pharmaceuticals or biologics, which could make it difficult for us to stop the infringement of our patents or marketing of competing products in violation of our proprietary rights generally. In addition, certain developing countries, including China and India, have compulsory licensing laws under which a patent owner may be compelled to grant licenses to third parties. In those countries, we and our licensors may have limited remedies if patents are infringed or if we or our licensors are compelled to grant a license to a third party, which could materially diminish the value of those patents. This could limit our potential revenue opportunities. 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.

Changes in patent law in the United States and other jurisdictions could diminish the value of patents in general, thereby impairing our ability to protect our product candidates.

As is the case with other biopharmaceutical companies, our success is heavily dependent on intellectual property, particularly patents. Obtaining and enforcing patents in the biopharmaceutical industry involves both technological and legal complexity and is therefore costly, time consuming and inherently uncertain. Changes in either the patent laws or interpretation of the patent laws in the United States could increase the uncertainties and costs. Patent reform legislation in the United States and other countries could increase those uncertainties and costs surrounding the prosecution of our patent applications and the enforcement or defense of our issued patents. For example, in September 2011 the Leahy-Smith America Invents Act (the Leahy-Smith Act) was signed into law and included a number of significant changes to U.S. patent law as then existed. These include provisions that affect the way patent applications are prosecuted, redefine prior art and provide more efficient and cost-effective avenues for competitors to challenge the validity of patents. These include allowing third-party submission of prior art to the USPTO during patent prosecution and additional procedures to attack the validity of a patent by USPTO administered post-grant proceedings, including post-grant review, *inter partes* review, and derivation proceedings. After March 2013, under the Leahy-Smith Act, the United States transitioned to a first inventor to file system in which, assuming that the other statutory requirements are met, the first inventor to file a patent application will be entitled to the patent on an invention regardless of whether a third party was the first to invent the claimed invention. 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 issued patents, all of which could have a material adverse effect on our business, financial condition, results of operations and prospects.

The U.S. Supreme Court has ruled on several patent cases in recent years, either narrowing the scope of patent protection available in certain circumstances or weakening the rights of patent owners in certain situations. Depending on future actions by the U.S. Congress, the U.S. courts, the USPTO and the relevant law-making bodies in other countries, the laws and regulations governing patents could change in unpredictable ways that would weaken our ability to obtain new patents or to enforce our existing patents and patents that we might obtain in the future.

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

Periodic maintenance fees, renewal fees, annuities fees and various other governmental fees on patents and/or patent applications are due to be paid to the USPTO and foreign patent agencies in several stages over the lifetime of the patent and/or patent application. The USPTO and various foreign governmental patent agencies also require compliance with a number of procedural, documentary, fee payment and other similar provisions during the patent application process. While an inadvertent lapse can in many cases be cured by payment of a late fee or by other means in accordance with the applicable rules, there are situations in which noncompliance can result in abandonment or lapse of the patent or patent application, resulting in partial or complete loss of patent rights in the relevant jurisdiction. Non-compliance events that could result in abandonment or lapse of a patent or patent application include, but are not limited to, failure to respond to official actions within prescribed time limits, non-payment of fees and failure to properly legalize and submit formal documents. If we fail to maintain the patents and patent applications covering our product candidates, our competitive position would be adversely affected.

We may rely on trade secret and proprietary know-how which can be difficult to trace and enforce and, if we are unable to protect the confidentiality of our trade secrets, our business and competitive position would be harmed.

In addition to seeking patents for some of our technology and product candidates, we may also rely on trade secrets, including unpatented know-how, technology and other proprietary information, to maintain our competitive position. Elements of our product candidate, including processes for their preparation and manufacture, may involve proprietary know-how, information, or technology that is not covered by patents, and thus for these aspects we may consider trade secrets and know-how to be our primary intellectual property. Any disclosure, either intentional or unintentional, by our employees, the employees of third parties with whom we share our facilities or third party consultants and vendors that we engage to perform research, clinical trials or manufacturing activities, or misappropriation by third parties (such as through a cybersecurity breach) of our trade secrets or proprietary information could enable competitors to duplicate or surpass our technological achievements, thus eroding our competitive position in our market.

Trade secrets and know-how can be difficult to protect. We require our employees to enter into written employment agreements containing provisions of confidentiality and obligations to assign to us any inventions generated in the course of their employment. We and any third parties with whom we share facilities enter into written agreements that include confidentiality and intellectual property obligations to protect each party's property, potential trade secrets, proprietary know-how, and information. We further seek to protect our potential trade secrets, proprietary know-how, and information in part, by entering into non-disclosure and confidentiality agreements with parties who are given access to them, such as our corporate collaborators, outside scientific collaborators, contract research organizations, contract manufacturers, consultants, advisors and other third parties. With our consultants, contractors, and outside scientific collaborators, these agreements typically include invention assignment obligations. Despite these efforts, any of these parties may breach the agreements and disclose our proprietary information, including our trade secrets, and we may not be able to obtain adequate remedies for such breaches. Enforcing a claim that a party illegally disclosed or misappropriated a trade secret is difficult, expensive and time-consuming, and the outcome is unpredictable. In addition, some courts inside and outside the United States are less willing or unwilling to protect trade secrets. If any of our trade secrets were to be lawfully obtained or independently developed by a competitor or other third party, we would have no right to prevent them 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 or other third party, our competitive position would be harmed.

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

We may be subject to claims that former employees, collaborators or other third parties have an interest in our patents or other intellectual property as an inventor or co-inventor. The failure to name the proper inventors on a patent application can result in the patents issuing thereon being unenforceable. Inventorship disputes may arise from conflicting views regarding the contributions of different individuals named as inventors, the effects of foreign laws where foreign nationals are involved in the development of the subject matter of the patent, conflicting obligations of third parties involved in developing our product candidates or as a result of questions regarding co-ownership of potential joint inventions. Litigation may be necessary to resolve these and other claims challenging inventorship and/or ownership. Alternatively, or additionally, we may enter into agreements to clarify the scope of our rights in such intellectual property. 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.

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

Patent rights are of limited duration. 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 product candidates are commercialized. Even if patents covering our product candidates are obtained, once the patent life has expired for a product, we may be open to competition from biosimilar or generic products. A patent term extension based on regulatory delay may be available in the United States. However, only a single patent can be extended for each marketing approval, and any patent can be extended only once, for a single product. Moreover, the scope of protection during the period of the patent term extension does not extend to the full scope of the claim, but instead only to the scope of the product as approved. Laws governing analogous patent term extensions in foreign jurisdictions vary widely, as do laws governing the ability to obtain multiple patents from a single patent family. Additionally, 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. If we are unable to obtain patent term extension or restoration, or the term of any such extension is less than we request, the period during which we will have the right to exclusively market our product will be shortened and our competitors may obtain approval of competing products following our patent expiration, and our revenue could be reduced, possibly materially.

Risks Related to our Business Operations

We are highly dependent on the services of our founders, Terry Rosen, Ph.D., who serves as our Chief Executive Officer, and Juan Jaen, Ph.D., who serves as our President.

We are highly dependent on the services of our founders, Terry Rosen, Ph.D., who serves as our Chief Executive Officer, and Juan Jaen, Ph.D., who serves as our President. Although we have entered into employment agreements with them, they are not for a specific term and each of them may terminate their employment with us at any time, though we are not aware of any present intention of either of these individuals to leave us.

Drs. Rosen and Jaen have significant experience identifying and developing biopharmaceuticals. Drs. Rosen and Jaen were previously the founders of Flexus Biosciences, Inc., which was acquired by Bristol-Myers Squibb approximately 18 months after it was founded to access its IDO-1 enzyme inhibitor. Previously, Dr. Rosen was Vice President of Therapeutic Discovery at Amgen, overseeing large- and small-molecule drug discovery efforts, and Dr. Jaen was Senior Vice President, Drug Discovery and Chief Scientific Officer at ChemoCentryx, having built a track record of efficiently moving quality product candidates from discovery into clinical development across a wide range of therapeutic areas, including oncology. We believe that their drug discovery and development experience, and overall biopharmaceutical company management experience, would be difficult to replace. However, the historical results, past performance and/or acquisitions of companies with which they were affiliated, including Flexus, do not necessarily predict or guarantee similar results for our company.

Drs. Rosen and Jaen have certain other business and personal commitments outside of serving as the Chief Executive Officer and President of Arcus, including serving on the boards of other companies and foundations.

We expect to expand our development, regulatory and operational capabilities and, as a result, we may encounter difficulties in managing our growth, which could disrupt our operations.

As we advance our research and development programs, we expect to experience significant growth in the number of our employees and the scope of our operations, particularly in the areas of clinical development, quality, regulatory affairs and, if any of our product candidates receives marketing approval, sales, marketing and distribution. To manage our anticipated future growth, we must:

- identify, recruit, integrate, maintain and motivate additional qualified personnel;
- manage our development efforts effectively, including the initiation and conduct of clinical trials for our product candidates, both as monotherapy and in combination with other intra-portfolio product candidates; and
- improve our operational, financial and management controls, reporting systems and procedures.

Our future financial performance and our ability to develop, manufacture and commercialize our product candidates will depend, in part, on our ability to effectively manage any future growth, and our management may also have to divert financial and other resources, and a disproportionate amount of its attention away from day-to-day activities in order to devote a substantial amount of time, to managing these growth activities.

We currently rely, and for the foreseeable future will continue to rely, in substantial part on certain third party contract organizations, advisors and consultants to provide certain services, including assuming substantial responsibilities for the conduct of our clinical trials and the manufacture of our product candidates. We cannot assure you that the services of such third party contract organizations, advisors and consultants will continue to be available to us on a timely basis when needed, or that we can find qualified replacements. In addition, if we are unable to effectively manage our outsourced activities or if the quality or accuracy of the services provided by our vendors or consultants is compromised for any reason, our clinical trials may be extended, delayed or terminated, and we may not be able to obtain marketing approval of our product candidates or otherwise advance our business. We cannot assure you that we will be able to properly manage our existing vendors or consultants or find other competent outside vendors and consultants on economically reasonable terms, or at all.

If we are not able to effectively expand our organization by hiring new employees and expanding our groups of consultants and contractors, we may not be able to successfully implement the tasks necessary to further develop and commercialize our product candidates and, accordingly, may not achieve our research, development and commercialization goals.

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

Our industry has experienced a high rate of turnover in recent years. Our ability to compete in the highly competitive biopharmaceuticals industry depends upon our ability to attract, retain and motivate highly skilled and experienced personnel with scientific, medical, regulatory, manufacturing and management skills and experience. We conduct our operations in the San Francisco Bay Area, a region that is home to many other biopharmaceutical companies as well as many academic and research institutions, resulting in fierce competition for qualified personnel. We may not be able to attract or retain qualified personnel in the future due to the intense competition for a limited number of qualified personnel among biopharmaceutical companies. Many of the other biopharmaceutical companies against which we compete have greater financial and other resources, different risk profiles and a longer history in the industry than we do. Our competitors may provide higher compensation, more diverse opportunities and/or better opportunities for career advancement. Any or all of these competing factors may limit our ability to continue to attract and retain high quality personnel, which could negatively affect our ability to successfully develop and commercialize our product candidates and to grow our business and operations as currently contemplated.

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

Our future profitability may depend, in part, on our ability to commercialize our product candidates in foreign markets for which we may rely on collaboration with third parties. We are not permitted to market or promote any of our product candidates before we receive marketing approval from the applicable regulatory authority in that foreign market, and we may never receive such marketing approval for any of our product candidates. To obtain marketing approval in many foreign countries, we must comply with numerous and varying regulatory requirements of such countries regarding safety and efficacy and governing, among other things, clinical trials and commercial sales, pricing and distribution of our product candidates, and we cannot predict success in these jurisdictions. If we obtain approval of our product candidates and ultimately commercialize our product candidates in foreign markets, we would be subject to additional risks and uncertainties, including:

- our customers' ability to obtain reimbursement for our product candidates in foreign markets;
- our inability to directly control commercial activities because we are relying on third parties;
- the burden of complying with complex and changing foreign regulatory, tax, accounting and legal requirements;
- different medical practices and customs in foreign countries affecting acceptance in the marketplace;
- import or export licensing requirements;
- longer accounts receivable collection times;
- longer lead times for shipping;
- language barriers for technical training;
- reduced protection of intellectual property rights in some foreign countries;
- the existence of additional potentially relevant third-party intellectual property rights;
- foreign currency exchange rate fluctuations; and
- the interpretation of contractual provisions governed by foreign laws in the event of a contract dispute.

Foreign sales of our product candidates could also be adversely affected by the imposition of governmental controls, political and economic instability, trade restrictions and changes in tariffs.

We face substantial competition, which may result in others discovering, developing or commercializing products more quickly or marketing them more successfully than us. If their product candidates are shown to be safer or more effective than ours, then our commercial opportunity will be reduced or eliminated.

The development and commercialization of new products is highly competitive. We compete in the segments of the pharmaceutical, biotechnology and other related markets that develop immunotherapies for the treatment of cancer. Our commercial opportunity could be reduced or eliminated if our competitors develop and commercialize products that are safer, more effective, have fewer or less severe side effects, are more convenient, or are less expensive than any products that we may develop or that would render any products that we may develop obsolete or non-competitive. Our competitors also may obtain marketing approval for their products more rapidly than we may obtain approval for ours, which could result in our competitors establishing a strong market position before we are able to enter the market.

Some of the other products in the same class as our product candidates have already been approved or are further along in development. With respect to our dual adenosine receptor antagonist, AB928, we are aware of several other clinical-stage selective adenosine A_{2a} R antagonists being developed by AstraZeneca/MedImmune, Corvus, and Novartis and a clinical-stage selective adenosine A_{2b} R antagonist being developed by Palobiofarma . For our small-molecule CD73 inhibitor, AB680, w e are aware of several pharmaceutical companies developing antibodies against this target, including AstraZeneca/MedImmune, Bristol-Myers Squibb, Corvus and Novartis in collaboration with Surface Oncology , all of whom have advanced their CD73 antibodies into clinical development . Other pharmaceutical companies, such as Calithera and Peloton Therapeutics, have small-molecule programs against this target. To our knowledge, AB680 is the only small molecule CD73 inhibitor in clinical development. Regarding our anti-PD-1 antibody, AB122, multiple large pharmaceutical companies have already received regulatory approvals for their anti-PD-1/PD-L1 antibodies, including AstraZeneca, Bristol-Myers Squibb, Merck, Pfizer in partnership with Merck K G a A , Regeneron in partnership with Sanofi Genzyme and Roche/Genentech, and there are also many other anti-PD-1 and anti-PD-L1 antibodies in clinical development. With respect to our anti-TIGIT antibody, AB154, we are aware of several pharmaceutical companies developing antibodies against this target, including Astellas, Bristol-Myers Squibb, Compugen, Genentech, iTEOS, Merck and OncoMed. As more product candidates within a particular class of drugs proceed through clinical development to regulatory review and approval, the amount and type of clinical data that may be required by regulatory authorities may increase or change. Consequently, the results of our clinical trials for product candidates in those class will likely need to show a risk benefit profile that is competitive with or more favorable than those products and product candidates in order to obtain marketing approval or, if approved, a product label that is favorable for commercialization. If the risk benefit profile is not competitive with those products or product candidates, we may have developed a product that is not commercially viable, that we are not able to sell profitably or that is unable to achieve favorable pricing or reimbursement. In such circumstances, our future product revenue and financial condition would be materially and adversely affected.

Many of our competitors, such as large pharmaceutical and biotechnology companies like AstraZeneca/MedImmune, Bristol-Myers Squibb, Merck, Novartis and Roche/Genentech, have longer operating histories and significantly greater financial resources and expertise in research and development, manufacturing, preclinical studies, 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 and other early stage companies may also prove to be significant competitors, particularly through collaborative arrangements with large and established companies. These third parties compete with us in recruiting and retaining qualified scientific and management personnel, establishing clinical trial sites and subject enrollment for clinical trials, as well as in acquiring technologies complementary to, or necessary for, our programs.

The key competitive factors affecting the success of all of our programs are likely to be their efficacy, safety, convenience, and availability of reimbursement. If we are not successful in developing, commercializing and achieving higher levels of reimbursement than our competitors, we will not be able to compete against them and our business would be materially harmed.

The development and commercialization of AB122 may face strong competition from other anti-PD-1 antibodies that have already received marketing approval by larger companies with substantial resources and more experience developing, manufacturing and commercializing biologic compounds.

As discussed above, some companies, such as AstraZeneca, Bristol-Myers Squibb, Merck, Pfizer in partnership with Merck KGaA, Regeneron in partnership with Sanofi Genzyme and Roche/Genentech, have anti-PD-1/PD-L1 antibodies that are approved and on the market, and other companies are developing anti-PD-1/PD-L1 antibodies for various oncology indications that are further along in development than AB122. This competitive environment could limit our development opportunities for AB122 or compromise our ability to successfully enroll our ongoing and future clinical trials with AB122 by limiting the availability of clinical trial investigators, sites and/or subjects which could slow, delay or limit the progress of AB122's development. As a result of these or other problems and risks, we may never receive marketing approval for AB122, may not realize the full commercial potential of AB122 as monotherapy or in combination with our other product candidates, may never recoup our financial investment or may never generate significant value or revenue from this asset.

Our internal information technology systems, or those of our third-party CROs or other contractors or consultants, may fail or suffer security breaches, loss or leakage of data, and other disruptions, which could result in a material disruption of our product candidates' development programs, compromise sensitive information related to our business or prevent us from accessing critical information, potentially exposing us to liability or otherwise adversely affecting our business.

We are increasingly dependent upon information technology systems, infrastructure and data to operate our business. In the ordinary course of business, we collect, store and transmit confidential information (including but not limited to intellectual property, proprietary business information and personal information). It is critical that we do so in a secure manner to maintain the confidentiality and integrity of such confidential information. We also have outsourced elements of our operations to third parties, and as a result we manage a number of third party contractors who have access to our confidential information.

Despite the implementation of security measures, given their size and complexity and the increasing amounts of confidential information that they maintain, our internal information technology systems and those of our third-party CROs and other contractors and consultants are potentially vulnerable to breakdown or other damage or interruption from service interruptions, system malfunction, natural disasters, terrorism, war and telecommunication and electrical failures, as well as security breaches from inadvertent or intentional actions by our employees, contractors, consultants, business partners, and/or other third parties, or from cyber-attacks by malicious third parties (including the deployment of harmful malware, ransomware, denial-of-service attacks, social engineering and other means to affect service reliability and threaten the confidentiality, integrity and availability of information), which may compromise our system infrastructure or lead to data leakage. To the extent that any disruption or security breach were to result in a loss of, or damage to, our data or applications, or inappropriate disclosure of confidential or proprietary information, we could incur liability and reputational damage and the further development and commercialization of our drug candidates could be delayed. While we have not experienced any such system failure, accident or security breach to date, we cannot assure you that our data protection efforts and our investment in information technology will prevent significant breakdowns, data leakages, breaches in our systems or other cyber incidents that could have a material adverse effect upon our reputation, business, operations or financial condition. For example, if such an event were to occur and cause interruptions in our operations, it could result in a material disruption of our programs and the development of our product candidates could be delayed. In addition, the loss of clinical trial data for our product candidates could result in delays in our marketing approval efforts and significantly increase our costs to recover or reproduce the data. Furthermore, significant disruptions of our internal information technology systems or security breaches could result in the loss, misappropriation, and/or unauthorized access, use, or disclosure of, or the prevention of access to, confidential information (including trade secrets or other intellectual property, proprietary business information, and personal information), which could result in financial, legal, business, and reputational harm to us. For example, any such event that leads to unauthorized access, use, or disclosure of personal information, including personal information regarding our clinical trial subjects or employees, could harm our reputation directly, compel us to comply with federal and/or state breach notification laws and foreign law equivalents, subject us to mandatory corrective action, and otherwise subject us to liability under laws and regulations that protect the privacy and security of personal information, which could result in significant legal and financial exposure and reputational damages that could potentially have an adverse effect on our business.

We or the third parties upon whom we depend may be adversely affected by earthquakes, fires or other natural disasters and our business continuity and disaster recovery plans may not adequately protect us from a serious disaster.

Our headquarters and main research facility are located in the San Francisco Bay Area, which in the past has experienced severe earthquakes and fires. If these earthquakes, fires, other natural disasters, terrorism and similar unforeseen events beyond our control prevented us from using all or a significant portion of our headquarters or research facility, it may be difficult or, in certain cases, impossible for us to continue our business for a substantial period of time. We do not have a disaster recovery or business continuity plan in place and may incur substantial expenses as a result of the absence or limited nature of our internal or third party service provider disaster recovery and business continuity plans, which, particularly when taken together with our lack of earthquake insurance, could have a material adverse effect on our business. Furthermore, integral parties in our supply chain are operating from single sites, increasing their vulnerability to natural disasters or other sudden, unforeseen and severe adverse events. If such an event were to affect our supply chain, it could have a material adverse effect on our ability to conduct our clinical trials, our development plans and business.

Unfavorable global economic and trade conditions could adversely affect our business, financial condition or results of operations.

Our results of operations could be adversely affected by general conditions in the global economy and in the global financial markets and global trade. To date, most of our clinical trial activity has been outside the United States, and unfavorable economic conditions resulting in the weakening of the U.S. dollar would make those clinical trials more costly to operate. Furthermore, the most recent global financial crisis caused extreme volatility and disruptions in the capital and credit markets. A severe or prolonged economic downturn could result in a variety of risks to our business, including a reduced ability to raise additional capital when needed on acceptable terms, if at all. A weak or declining economy could also strain our suppliers, possibly resulting in supply disruption. In addition, proposed tariffs by the Trump administration have included a 25% tariff on raw ingredients for pharmaceuticals, such as the active pharmaceutical ingredients for our product candidates. Given our exclusive relationship with WuXi Biologics, located in China, for the manufacture of AB122 and AB154 and for biologics CMC development, these additional tariffs, if they were to be imposed, would have an adverse impact on our operating results and financial condition. Any of the foregoing could harm our business and we cannot anticipate all of the ways in which the current economic climate and financial market conditions could adversely impact our business.

We conduct clinical development operations through our Australian wholly-owned subsidiary. If we do not effectively manage our operations in Australia, our business and results of operations may suffer.

In 2017, we formed a wholly-owned Australian subsidiary, Arcus Biosciences Australia Pty Ltd, to develop our product candidates in Australia. Due to the geographical distance and lack of employees currently in Australia, as well as our lack of experience operating in Australia, we may not be able to efficiently or successfully monitor any clinical trials we conduct in Australia nor the development of our product candidates in Australia.

Our ability to use our net operating loss carryforwards and certain other tax attributes may be limited.

We have incurred substantial losses during our history and do not expect to become profitable in the near future, and we may never achieve profitability. Unused losses for the tax year ended December 31, 2017 and prior tax years will carry forward to offset future taxable income, if any, until such unused losses expire. Unused losses generated after December 31, 2017, under new tax legislation will not expire and may be carried forward indefinitely but will be only deductible to the extent of 80% of current year taxable income in any given year. In addition, both our current and our future unused losses may be subject to limitation under Sections 382 and 383 of the Internal Revenue Code of 1986, as amended (IRC), if we undergo an "ownership change," generally defined as a greater than 50 percentage point change (by value) in its equity ownership by certain stockholders over a three-year period. We performed an analysis under IRC Section 382 through December 31, 2018 with respect to our net operating loss and credit carryforwards. We concluded that, while an ownership change occurred in previous years as defined under IRC Section 382, we do not expect such ownership changes to result in the expiration of our net operating loss carryforwards prior to utilization.

However, future equity issuances may result in an additional ownership change. As a result, our pre-2018 net operating loss carryforwards may expire prior to being used, or our ability to use all of our pre-change net operating loss carryforwards (NOLs) and other pre-change tax attributes (such as research tax credits) to offset our post-change income or taxes may be subject to limitations. Similar provisions of state tax law may also apply to limit our use of accumulated state tax attributes. In addition, at the state level, there may be periods during which the use of NOLs is suspended or otherwise limited, which could accelerate or permanently increase state taxes owed. Therefore, even if we attain profitability, we may be unable to use all or a material portion of our NOLs and other tax attributes, which could adversely affect our future cash flows.

U.S. federal income tax reform could adversely affect us.

In December 2017, new legislation significantly revised the Internal Revenue Code of 1986, as amended. The newly enacted federal income tax law, among other things, contains significant changes to corporate taxation, including reduction of the corporate tax rate from a top marginal rate of 35% to a flat rate of 21%, limitation of the tax deduction for interest expense to 30% of adjusted earnings (except for certain small businesses), limitation of the deduction for net operating losses to 80% of current year taxable income and elimination of net operating loss carrybacks, one time taxation of offshore earnings at reduced rates regardless of whether they are repatriated, elimination of U.S. tax on foreign earnings (subject to certain important exceptions), immediate deductions for certain new investments instead of deductions for depreciation expense over time, and modifying or repealing many business deductions and credits. We do not expect this tax legislation to have a material impact to our current projection of minimal cash taxes for the near future. However, we continue to examine the impact that this tax legislation may have on our business in the longer term. Accordingly, notwithstanding the reduction in the corporate income tax rate, the overall impact of the new federal tax law is uncertain and our business and financial condition could be adversely affected. In addition, it is uncertain if and to what extent various states will conform to the newly enacted federal tax law. The impact of this tax legislation on holders of our common stock is also uncertain and could be adverse. We urge prospective investors to consult with their legal and tax advisors with respect to this legislation and the potential tax consequences of investing in or holding our common stock.

Risks Related to Our Industry

Product liability lawsuits against us could cause us to incur substantial liabilities and could limit our commercialization of any product candidates 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 products caused injuries, we could incur substantial liabilities. Regardless of merit or eventual outcome, product liability claims may result in:

- delay or termination of clinical trials;
- decreased demand for any product candidates or products that we may develop;
- injury to our reputation and significant negative media attention;
- withdrawal of clinical trial subjects;
- initiation of investigations by regulators;
- significant costs to defend the related litigation and diversion of management's time and our resources;
- substantial monetary awards to study subjects or patients;
- product recalls, withdrawals or labeling, marketing or promotional restrictions;
- loss of revenue; and
- the inability to commercialize any products that we may develop.

Although we maintain product liability insurance coverage, it may not be adequate to cover all liabilities that we may incur. We anticipate that we will need to increase our insurance coverage as our product candidates advance through clinical trials and if we successfully commercialize any products. 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.

Our industry is highly regulated by the FDA and comparable foreign regulatory agencies. We must comply with extensive, strictly enforced regulatory requirements to develop, obtain, and maintain marketing approval for any of our product candidates.

Securing FDA or comparable foreign regulatory approval requires the submission of extensive preclinical and clinical data and supporting information for each therapeutic indication to establish the product candidate's safety and efficacy for its intended use. It takes years to complete the testing of a new drug or biologic and development delays and/or failure can occur at any stage of testing. Any of our present and future clinical trials may be delayed, halted, not authorized, or approval of any of our products may be delayed or may not be obtained due to any of the following:

- any preclinical study or clinical trial may fail to produce safety and efficacy results satisfactory to the FDA or comparable foreign regulatory authorities;
- preclinical and clinical data can be interpreted in different ways, which could delay, limit or prevent marketing approval;
- negative or inconclusive results from a preclinical study or clinical trial or adverse events during a clinical trial could cause a preclinical study or clinical trial to be repeated or a development program to be terminated, even if other studies relating to the development program are ongoing or have been completed and were successful;
- the FDA or comparable foreign regulatory authorities can place a clinical hold on a trial if, among other reasons, it finds that subjects enrolled in the trial are or would be exposed to an unreasonable and significant risk of illness or injury;
- the facilities that we utilize, or the processes or facilities of third party vendors, including without limitation the contract manufacturers who will be manufacturing drug substance and drug product for us or any potential collaborators, may not satisfactorily complete inspections by the FDA or comparable foreign regulatory authorities; and
- we may encounter delays or rejections based on changes in FDA policies or the policies of comparable foreign regulatory authorities during the period in which we develop a product candidate or the period required for review of any final marketing approval before we are able to market any product candidate.

In addition, information generated during the clinical trial process is susceptible to varying interpretations that could delay, limit, or prevent marketing approval at any stage of the approval process. For example, results from uncontrolled trials, meaning trials in which there is no control group such as a placebo group, are inherently difficult to interpret and may be made more difficult where a clinical trial is evaluating two or more investigational product candidates in combination that have not yet been approved. As a key element of our strategy is the development of intra-portfolio combinations, many of our clinical trials will test multiple investigational product candidates in uncontrolled studies, such as the clinical trials in our Phase 1/1b program for AB928 where we are evaluating AB928 in combination with AB122, and the Phase 1 trial for AB154 which will evaluate AB154 in combination with AB122. Moreover, early positive preclinical or clinical trial results may not be replicated in later clinical trials. As more product candidates within a particular class of drugs proceed through clinical development to regulatory review and approval, the amount and type of clinical data that may be required by regulatory authorities may increase or change. Failure to demonstrate adequately the quality, safety and efficacy of any of our product candidates would delay or prevent marketing approval of the applicable product candidate. We cannot assure you that if clinical trials are completed, either we or our potential collaborators will submit applications for required authorizations to manufacture or market potential products or that any such application will be reviewed and approved by appropriate regulatory authorities in a timely manner, if at all.

Even if we receive marketing approval for a product candidate, we will be subject to ongoing regulatory obligations and continued regulatory review, which may result in significant additional expense and subject us to restrictions, withdrawal from the market, or penalties if we fail to comply with applicable regulatory requirements or if we experience unanticipated problems with our product candidates, when and if approved.

Once marketing approval has been granted by the FDA and comparable foreign regulatory authorities, the approved product and those entities within the product's supply chain are subject to continual review by the applicable regulatory authorities. Any marketing approval that we receive for our product candidates may be subject to limitations on the indicated uses for which the product may be marketed or contain requirements for potentially costly post-marketing follow-up trials or surveillance to monitor the safety and efficacy of the product. In addition, if the FDA and comparable foreign regulatory authorities approve any of our product candidates, we will be subject to extensive and ongoing regulatory requirements with regard to labeling, packaging, adverse event reporting, storage, distribution, advertising, promotion, recordkeeping and submission of safety and other post-market information. Manufacturers of our products and manufacturers' facilities are required to comply with cGMP regulations, which include requirements related to quality control and quality assurance as well as the corresponding maintenance of records and documentation.

Further, regulatory authorities must approve these manufacturing facilities before they can be used to manufacture our products, and these facilities are subject to continual review and periodic inspections by the FDA and other comparable foreign regulatory authorities for compliance with cGMP regulations. Accordingly, we and others with whom we work must continue to expend time, money and effort in all areas of regulatory compliance, including manufacturing, production and quality control. We will also be required to report certain adverse reactions and production problems, if any, to the FDA and other comparable regulatory authorities and to comply with requirements concerning advertising and promotion for our products. If we, any future collaboration partner or a regulatory authority discovers previously unknown problems with a product, such as adverse events of unanticipated severity or frequency, or problems with the facility where the product is manufactured, a regulatory authority may impose restrictions on that product, the collaboration partner, the manufacturer or us, including requiring withdrawal of the product from the market or suspension of manufacturing.

The FDA as well as other comparable regulatory authorities closely regulate the post-approval marketing and promotion of therapeutic products to ensure they are marketed only for the approved indications and in accordance with the provisions of the approved labeling and regulatory requirements. The FDA and other comparable regulatory authorities also impose stringent restrictions on communications regarding off-label use and if we do not restrict the marketing of our products only to their approved indications, we may be subject to enforcement action for off-label marketing. If we, our product candidates or the manufacturing facilities for our product candidates are not found to be in compliance with regulatory requirements of the FDA and comparable foreign regulatory authorities, we could be subject to administrative or judicially imposed sanctions, including:

- warning letters or untitled letters;
- mandated modifications to promotional materials or the required provision of corrective information to healthcare practitioners;
- restrictions imposed on the product or its manufacturers or manufacturing processes;
- restrictions imposed on the labeling or marketing of the product;
- restrictions imposed on product distribution or use;
- requirements for post-marketing clinical trials;
- suspension of any ongoing clinical trials;
- suspension of or withdrawal of marketing approval;
- voluntary or mandatory product recalls and publicity requirements;
- refusal to approve pending applications for marketing approval of new products or supplements to approved applications filed by us;
- restrictions on operations, including costly new manufacturing requirements;

- seizure or detention of our products;
- refusal to permit the import or export of our products;
- required entry into a consent decree, which can include imposition of various fines (including restitution or disgorgement of profits or revenue), reimbursements for inspection costs, required due dates for specific actions and penalties for noncompliance;
- civil or criminal penalties; or
- injunctions.

Widely publicized events concerning the safety risk of certain products have resulted in their withdrawal from the market, revisions to product labeling that further limit use of the products and the imposition by the FDA of REMS to ensure that the benefits of the product outweigh its risks. In addition, because of the serious public health risks of high profile adverse safety events with certain products, the FDA may require, as a condition of approval, costly REMS programs.

The regulatory requirements and policies may change and additional government regulations may be enacted for which we may also be required to comply. We cannot predict the likelihood, nature or extent of government regulation that may arise from future legislation or administrative action, either in the United States or in other countries. If we or any future collaboration partner are not able to maintain regulatory compliance, we or such collaboration partner, as applicable, will not be permitted to market our future products and our business will suffer.

Failure to comply with health and data protection laws and regulations could lead to government enforcement actions (which could include civil or criminal penalties), private litigation, and/or adverse publicity and could negatively affect our operating results and business.

We and any potential collaborators may be subject to federal, state, and foreign data protection laws and regulations (i.e., laws and regulations that address privacy and data security). In the United States, numerous federal and state laws and regulations, including federal health information privacy laws, state data breach notification laws, state health information privacy laws, and federal and state consumer protection laws (e.g., Section 5 of the FTC Act), that govern the collection, use, disclosure, and protection of health-related and other personal information could apply to our operations or the operations of our collaborators. In addition, we may obtain health information from third parties (including research institutions from which we obtain clinical trial data) that are subject to privacy and security requirements under federal Health Insurance Portability and Accountability Act of 1996 (HIPAA) as amended by the Health Information Technology for Economic and Clinical Health Act of 2009 (HITECH). Depending on the facts and circumstances, we could be subject to criminal penalties if we knowingly obtain, use, or disclose individually identifiable health information maintained by a HIPAA-covered entity in a manner that is not authorized or permitted by HIPAA.

The legislative and regulatory landscape for privacy and data security continues to evolve, and we expect that there will continue to be new proposed laws, regulations and industry standards relating to privacy and data security in the United States, the EU and other jurisdictions. This increased focus on privacy and data security issues may negatively affect our operating results and our business. For example, the California Consumer Privacy Act of 2018 (CCPA), which takes effect on January 1, 2020, gives California residents expanded rights to access and require deletion of their personal information, opt out of certain personal information sharing, and receive detailed information about how their personal information is used. In addition, the CCPA authorizes private lawsuits to recover statutory damages for certain data breaches. While it exempts some data regulated by HIPAA and certain clinical trials data, the CCPA may increase our compliance costs and potential liability with respect to other personal information we collect about California residents. Some observers note that the CCPA could mark the beginning of a trend toward more stringent privacy legislation in the U.S., which could increase our potential liability and adversely affect our business.

International data protection laws also apply to health-related and other personal data obtained outside the United States. In the European Union, Regulation (EU) 2016/679 (General Data Protection Regulation) took effect in May 2018 and imposes , in some cases, stricter obligations than data protection laws in the United States on the use of health-related and other personal data . These requirements include the obligation to appoint data protection officers in certain circumstances, rights for individuals to be "forgotten" and to data portability, and the obligation to make public notification of significant data breaches. Under the General Data Protection Regulation, data protection authorities can also impose administrative fines of up to 4% of our total worldwide turnover or up to €20 million (whichever is higher). In addition, the General Data Protection Regulation only permits the transfer of personal data outside the European Economic Area (EEA) to countries that offer a level of data protection deemed adequate by the European Commission, unless an approved data transfer mechanism is in place . Some of the approved data transfer mechanisms face legal challenges in the EU, which adds to the complexity of transferring personal data outside the EEA. The General Data Protection Regulation increase s our responsibility and liability in relation to personal data that we process, and we must put in place additional mechanisms to ensure compliance with the new EU data protection rules.

Failure to comply with U.S. and international data protection laws and regulations could result in government enforcement actions (which could include civil or criminal penalties), private litigation, and/or adverse publicity and could negatively affect our operating results and business. Moreover, clinical trial subjects about whom we or our potential collaborators obtain information, as well as the providers who share this information with us, may contractually limit our ability to use and disclose the information. Claims that we have violated individuals' privacy rights, failed to comply with data protection laws, or breached our contractual obligations, even if we are not found liable, could be expensive and time-consuming to defend and could result in adverse publicity that could harm our business.

Changes in healthcare law and implementing regulations, as well as changes in healthcare policy, may impact our business in ways that we cannot currently predict, and may have a significant adverse effect 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, including in the European Union, 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.

The Patient Protection and Affordable Care Act, as amended by the Health Care and Education Reconciliation Act of 2010, or collectively the Affordable Care Act, substantially changed the way healthcare is financed by both the government and private insurers, and significantly impacts the U.S. pharmaceutical industry. The Affordable Care Act, among other things: (i) introduced a new average manufacturer price definition for drugs and biologics that are inhaled, infused, instilled, implanted or injected and not generally dispensed through retail community pharmacies; (ii) increased the minimum Medicaid rebates owed by manufacturers under the Medicaid Drug Rebate Program and expanded rebate liability from fee-for-service Medicaid utilization to include the utilization of Medicaid managed care organizations as well; (iii) established a branded prescription drug fee that pharmaceutical manufacturers of branded prescription drugs must pay to the federal government; (iv) expanded the list of covered entities eligible to participate in the 340B drug pricing program by adding new entities to the program; (v) established a new Medicare Part D coverage gap discount program, in which manufacturers must agree to offer 50% point-of-sale discounts off negotiated prices of applicable brand drugs to eligible beneficiaries during their coverage gap period, as a condition for the manufacturer's outpatient drugs to be covered under Medicare Part D; (vi) extended manufacturers' Medicaid rebate liability to covered drugs dispensed to individuals who are enrolled in Medicaid managed care organizations; (vii) expanded eligibility criteria for Medicaid programs by, among other things, allowing states to offer Medicaid coverage to additional individuals and by adding new mandatory eligibility categories for individuals with income at or below 133% of the federal poverty level, thereby potentially increasing manufacturers' Medicaid rebate liability; (viii) created a licensure framework for follow on biologic products; and (ix) established a Center for Medicare Innovation at the Centers for Medicare and Medicaid Services (CMS) to test innovative payment and service delivery models to lower Medicare and Medicaid spending, potentially including prescription drug spending that began in 2011.

Since its enactment, there have been judicial and Congressional challenges to certain aspects of the Affordable Care Act, as well as recent efforts by the Trump administration to repeal or replace certain aspects of the Affordable Care Act. Since January 2017, President Trump has signed two Executive Orders designed to delay the implementation of certain provisions of the Affordable Care Act or otherwise circumvent some of the requirements for health insurance mandated by the Affordable Care Act. The Trump administration has also announced that it will discontinue the payment of cost-sharing reduction (CSR) payments to insurance companies until Congress approves the appropriation of funds for the CSR payments. The loss of the CSR payments is expected to increase premiums on certain policies issued by qualified health plans under the Affordable Care Act. A bipartisan bill to appropriate funds for CSR payments has been introduced in the Senate, but the future of that bill is uncertain. In addition, CMS has recently proposed regulations that would give states greater flexibility in setting benchmarks for insurers in the individual and small group marketplaces, which may have the effect of relaxing the essential health benefits required under the Affordable Care Act for plans sold through such marketplaces. Furthermore, each chamber of Congress has put forth multiple bills designed to repeal or repeal and replace portions of the Affordable Care Act. While Congress has not passed repeal legislation, the newly enacted federal income tax law includes a provision repealing, effective January 1, 2019, the tax-based shared responsibility payment imposed by the Affordable Care Act on certain individuals who fail to maintain qualifying health coverage for all or part of a year that is commonly referred to as the "individual mandate." Congress may consider other legislation to repeal and replace elements of the Affordable Care Act. We continue to evaluate the effect that the Affordable Care Act and its possible repeal and replacement has on our business. It is uncertain the extent to which any such changes may impact our business or financial condition.

Other legislative changes have been proposed and adopted since the Affordable Care Act was enacted. These changes include aggregate reductions to Medicare payments to providers of up to 2% per fiscal year pursuant to the Budget Control Act of 2011 and subsequent laws, which began in 2013 and will remain in effect through 2025 unless additional Congressional action is taken. New laws may result in additional reductions in Medicare and other healthcare funding, which may materially adversely affect customer demand and affordability for our products and, accordingly, the results of our financial operations. Additional changes that may affect our business include the expansion of new programs such as Medicare payment for performance initiatives for physicians under the Medicare Access and CHIP Reauthorization Act of 2015 (MACRA) which will first affect physician payment in 2019. At this time, it is unclear how the introduction of the Medicare quality payment program will impact overall physician reimbursement.

Also, there has been heightened governmental scrutiny recently over the manner in which drug manufacturers set prices for their marketed products, which have resulted in several Congressional inquiries and proposed bills, as well as state efforts, 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 drug products. Individual states in the United States have become increasingly aggressive in passing legislation and implementing 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. For example, in 2017, the California State Assembly approved SB17, which requires pharmaceutical companies to notify health insurers and government health plans at least 60 days before any scheduled increases in the prices of their products if they exceed 16% over a two-year period, and further requiring pharmaceutical companies to explain the reasons for such increase. Effective in 2016, Vermont passed a law requiring certain manufacturer identified by the state to justify their price increases.

We expect that these and other healthcare reform measures that may be adopted in the future may result in more rigorous coverage criteria and lower reimbursement, and in additional downward pressure on the price that we receive for any approved product. Any reduction in reimbursement from Medicare or other government-funded 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, once marketing approval is obtained.

In the European Union, coverage and reimbursement status of any product candidates for which we obtain regulatory approval are provided for by the national laws of EU Member States. The requirements may differ across the EU Member States. Also at national level, actions have been taken to enact transparency laws regarding payments between pharmaceutical companies and health care professionals.

We will be subject to applicable fraud and abuse, transparency, government price reporting, 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 will play a primary role in the recommendation and prescription of any future product candidates we may develop and any product candidates for which we obtain marketing approval. Our arrangements with third-party payors and customers may expose us to broadly applicable fraud and abuse and other healthcare laws and regulations that may affect the business or financial arrangements and relationships through which we would market, sell and distribute our products. Even though we do not and will not control referrals of healthcare services or bill directly to Medicare, Medicaid or other third-party payors, federal and state healthcare laws and regulations pertaining to fraud and abuse and patients' rights are and will be applicable to our business. The laws that may affect our ability to operate include, but are not limited to:

- the federal Anti-Kickback Statute, which prohibits any person or entity from, among other things, knowingly and willfully soliciting, receiving, offering or paying any remuneration, directly or indirectly, overtly or covertly, in cash or in kind, to induce or reward either the referral of an individual for, or the purchase, order or recommendation of an item or service reimbursable, 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. The Anti-Kickback Statute has also been interpreted to apply to arrangements between pharmaceutical manufacturers on the one hand and prescribers, purchasers, and formulary managers on the other the other hand. There are a number of statutory exceptions and regulatory safe harbors protecting some common activities from prosecution;
- federal civil and criminal false claims laws and civil monetary penalty laws, such as the False Claims Act (FCA) which imposes significant penalties and can be enforced by private citizens through civil qui tam actions, prohibits individuals or entities from, among other things, knowingly presenting, or causing to be presented, false, fictitious or fraudulent claims for payment of federal funds, and knowingly making, using or causing to be made or used a false record or statement material to a false or fraudulent claim to avoid, decrease or conceal an obligation to pay money to the federal government. For example, pharmaceutical companies have been prosecuted under the FCA in connection with their alleged off-label promotion of drugs, purportedly concealing price concessions in the pricing information submitted to the government for government price reporting purposes, and allegedly providing free product to customers with the expectation that the customers would bill federal health care programs for the product. In addition, 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 FCA. As a result of a modification made by the Fraud Enforcement and Recovery Act of 2009, a claim includes "any request or demand" for money or property presented to the U.S. government. In addition, manufacturers can be held liable under the FCA even when they do not submit claims directly to government payors if they are deemed to "cause" the submission of false or fraudulent claims. Criminal prosecution is also possible for making or presenting a false, fictitious or fraudulent claim to the federal government. Government enforcement agencies and private whistleblowers have investigated pharmaceutical companies for or asserted liability under the FCA for a variety of alleged promotional and marketing activities, such as providing free product to customers with the expectation that the customers would bill federal programs for the product, providing consulting fees and other benefits to physicians to induce them to prescribe products, engaging in promotion for "off-label" uses, and submitting inflated best price information to the Medicaid Rebate Program;
- HIPAA, among other things, imposes criminal liability for executing or attempting to execute a scheme to defraud any healthcare benefit program, including private third-party payors, knowingly and willfully embezzling or stealing from a healthcare benefit program, willfully obstructing a criminal investigation of a healthcare offense, and creates federal criminal laws that prohibit knowingly and willfully falsifying, concealing or covering up a material fact or making any materially false, fictitious or fraudulent statement or representation, or making or using any false writing or document knowing the same to contain any materially false, fictitious or fraudulent statement or entry in connection with the delivery of or payment for healthcare benefits, items or services;

- HIPAA, as amended by HITECH and its implementing regulations, which imposes privacy, security and breach reporting obligations with respect to individually identifiable health information upon entities subject to the law, such as health plans, healthcare clearinghouses and healthcare providers and their respective business associates that perform services for them that involve 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 U.S. federal courts to enforce the federal HIPAA laws and seek attorneys' fees and costs associated with pursuing federal civil actions;
- federal and state consumer protection and unfair competition laws, which broadly regulate marketplace activities and activities that potentially harm consumers;
- the federal transparency requirements under the Physician Payments Sunshine Act, created under the Affordable Care Act, which requires, among other things, certain manufacturers of drugs, devices, biologics and medical supplies reimbursed under Medicare, Medicaid, or the Children's Health Insurance Program to report to the Department of Health and Human Services information related to payments and other transfers of value provided to physicians and teaching hospitals and physician ownership and investment interests, including such ownership and investment interests held by a physician's immediate family members;
- state and foreign law equivalents of each of the above federal laws, such as anti-kickback and false claims laws, that may impose similar or more prohibitive restrictions, and may apply to items or services reimbursed by any non-governmental third-party payors, including private insurers; and
- state and foreign laws that require pharmaceutical companies to implement compliance programs, comply with the pharmaceutical industry's voluntary compliance guidelines and the relevant compliance guidance promulgated by the federal government, or to track and report gifts, compensation and other remuneration provided to physicians and other health care providers, and other federal, state and foreign laws that govern the privacy and security of health information or personally identifiable information in certain circumstances, including state health information privacy and data breach notification laws which govern the collection, use, disclosure, and protection of health-related and other personal information, many of which differ from each other in significant ways and often are not pre-empted by HIPAA, thus requiring additional compliance efforts.

We have entered into consulting and scientific advisory board arrangements with physicians and other healthcare providers, including some who could influence the use of our product candidates, if approved. Because of the complex and far-reaching nature of these laws, regulatory agencies may view these transactions as prohibited arrangements that must be restructured, or discontinued, or for which we could be subject to other significant penalties. We could be adversely affected if regulatory agencies interpret our financial relationships with providers who may influence the ordering of and use our product candidates, if approved, to be in violation of applicable laws.

The scope and enforcement of each of these laws is uncertain and subject to rapid change in the current environment of healthcare reform, especially in light of the lack of applicable precedent and regulations. Federal and state enforcement bodies have recently increased their scrutiny of interactions between healthcare companies and healthcare providers, which has led to a number of investigations, prosecutions, convictions and settlements in the healthcare industry. Responding to investigations can be time-and resource-consuming and can divert management's attention from the business. Any such investigation or settlement could increase our costs or otherwise have an adverse effect on our business.

Ensuring that our business arrangements with third parties comply with applicable healthcare laws and regulations will likely be costly. If our operations are found to be in violation of any of these laws or any other current or future governmental laws and regulations that may apply to us, we may be subject to significant civil, criminal and administrative penalties, damages, fines, disgorgement, individual imprisonment, exclusion from government funded healthcare programs, such as Medicare and Medicaid, contractual damages, reputational harm, diminished profits and future earnings, additional reporting obligations and oversight if we become subject to a corporate integrity agreement or other agreement to resolve allegations of non-compliance with these laws, and the curtailment or restructuring of our operations, any of which could substantially disrupt our operations. If any of the physicians or other healthcare providers or entities with whom we expect to do business is found to be not in compliance with applicable laws, they may be subject to criminal, civil or administrative sanctions, including exclusions from government funded healthcare programs.

We are subject to certain U.S. and foreign anti-corruption, anti-money laundering, export control, sanctions, and other trade laws and regulations. We can face serious consequences for violations.

U.S. and foreign anti-corruption, anti-money laundering, export control, sanctions, and other trade laws and regulations (collectively, Trade Laws) prohibit, among other things, companies and their employees, agents, clinical research organizations, legal counsel, accountants, consultants, contractors, and other partners from authorizing, promising, offering, providing, soliciting, or receiving directly or indirectly, corrupt or improper payments or anything else of value to or from recipients in the public or private sector. Violations of Trade Laws can result in substantial criminal fines and civil penalties, imprisonment, the loss of trade privileges, debarment, tax reassessments, breach of contract and fraud litigation, reputational harm, and other consequences. We have direct or indirect interactions with officials and employees of government agencies or government-affiliated hospitals, universities, and other organizations. We also expect our non-U.S. activities to increase over time. We expect to rely on third parties for research, preclinical studies, and clinical trials and/or to obtain necessary permits, licenses, patent registrations, and other marketing approvals. We can be held liable for the corrupt or other illegal activities of our personnel, agents, or partners, even if we do not explicitly authorize or have prior knowledge of such activities.

If we fail to comply with environmental, health and safety laws and regulations, we could become subject to fines or penalties or incur costs that could have a material adverse effect on the success of our business.

We, and the third parties with whom we share our facilities, are subject to numerous environmental, health and safety laws and regulations, including those governing laboratory procedures and the handling, use, storage, treatment and disposal of hazardous materials and wastes. Each of our operations involve the use of hazardous and flammable materials, including chemicals and biological and radioactive materials. Each of our operations also produce hazardous waste products. We generally contract with third parties for the disposal of these materials and wastes. We cannot eliminate the risk of contamination or injury from these materials. We could be held liable for any resulting damages in the event of contamination or injury resulting from the use of hazardous materials by us or the third parties with whom we share our facilities, and any liability could exceed our resources. We also could incur significant costs associated with civil or criminal fines and penalties.

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

In addition, we may incur substantial costs in order to comply with current or future environmental, health and safety laws and regulations. These current or future laws and regulations may impair our research and development. Failure to comply with these laws and regulations also may result in substantial fines, penalties or other sanctions.

Risks Related to our Common Stock

The stock price of our common stock has been and may continue to be volatile or may decline regardless of our operating performance.

The market price of our common stock has fluctuated and may fluctuate significantly in response to numerous factors, many of which are beyond our control, including:

- overall performance of the equity markets;
- our operating performance and the performance of other similar companies;
- results from our ongoing clinical trials and future clinical trials with our current and future product candidates or of our competitors;
- changes in our projected operating results that we provide to the public, our failure to meet these projections or changes in recommendations by securities analysts that elect to follow our common stock;
- regulatory, trade or legal developments in the United States and other countries, including changes in tariffs or other trade restrictions;

- the level of expenses related to future product candidates or clinical development programs;
- our failure to achieve product development goals in the timeframe we announce;
- announcements of acquisitions, strategic alliances or significant agreements by us or by our competitors;
- recruitment or departure of key personnel;
- the economy as a whole and market conditions in our industry;
- trading activity by a limited number of stockholders who together beneficially own a majority of our outstanding common stock;
- the size of our market float; and
- any other factors discussed in this report.

In addition, the stock markets have experienced extreme price and volume fluctuations that have affected and continue to affect the market prices of equity securities of many immuno-oncology companies. Stock prices of many immuno-oncology companies have fluctuated in a manner unrelated or disproportionate to the operating performance of those companies. In the past, stockholders have filed securities class action litigation following periods of market volatility. If we were to become involved in securities litigation, it could subject us to substantial costs, divert resources and the attention of management from our business and adversely affect our business.

Sales of substantial amounts of our outstanding shares may cause the price of our common stock to decline.

The price of our common stock could decline if there are substantial sales of our common stock, particularly sales by our directors, executive officers and significant stockholders, or if there is a large number of shares of our common stock available for sale and the market perceives that sales will occur. Certain of our stockholders have rights, subject to some conditions, to require us to file registration statements covering their shares or to include their shares in registration statements that we may file for ourselves or our stockholders, subject to market standoff and lockup agreements. We have also registered shares of common stock that we have issued and may issue under our employee equity incentive plans. These shares can be sold freely in the public market upon issuance, subject to vesting conditions and, in the case of our affiliates, volume limitations under Rule 144 under the Securities Act of 1933, as amended.

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

The trading price of our common stock will depend in part on the research and reports that securities or industry analysts publish about us or our business. To date, only a few securities analysts have published research on our company and if they were to downgrade our common stock or publish inaccurate or unfavorable research about our business, our common stock price would likely decline. If one or more of these analysts were to cease coverage of us or fail to publish reports on us regularly, demand for our common stock could decrease, which might cause our common stock price and trading volume to decline.

If we fail to maintain proper and effective internal controls, our ability to produce accurate and timely financial statements could be impaired, which could result in sanctions or other penalties that would harm our business.

We are subject to the reporting requirements of the Exchange Act, the Sarbanes-Oxley Act and the rules and regulations of the New York Stock Exchange. The Sarbanes-Oxley Act requires, among other things, that we maintain effective disclosure controls and procedures and internal controls over financial reporting. Commencing with our fiscal year ending December 31, 2019, we must perform system and process design evaluation and testing of the effectiveness of our internal controls over financial reporting to allow management to report on the effectiveness of our internal controls over financial reporting in our Form 10-K filing for that year, as required by Section 404 of the Sarbanes-Oxley Act. This will require that we incur substantial additional professional fees and internal costs to expand our accounting and finance functions and that we expend significant management efforts. We have never been required to test our internal controls within a specified period and, as a result, we may experience difficulty in meeting these reporting requirements in a timely manner.

We may discover weaknesses in our system of internal financial and accounting controls and procedures that could result in a material misstatement of our consolidated 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 over financial reporting, we may not be able to produce timely and accurate financial statements. If that were to happen, our investors could lose confidence in our reported financial information, the market price of our stock could decline and we could be subject to sanctions or investigations by the SEC or other regulatory authorities.

Our disclosure controls and procedures may not prevent or detect all errors or acts of fraud.

We are subject to the periodic reporting requirements of the Exchange Act. We designed our disclosure controls and procedures to reasonably assure that information we must disclose in reports we file or submit under the Exchange Act is accumulated and communicated to management, and recorded, processed, summarized and reported within the time periods specified in the rules and forms of the SEC. We believe that any disclosure controls and procedures or internal controls and procedures, no matter how well-conceived and operated, can provide only reasonable, not absolute, assurance that the objectives of the control system are met.

These inherent limitations include the realities that judgments in decision-making can be faulty, and that breakdowns can occur because of simple error or mistake. For example, our directors or executive officers could inadvertently fail to disclose a new relationship or arrangement causing us to fail to make any related party transaction disclosures. Additionally, controls can be circumvented by the individual acts of some persons, by collusion of two or more people or by an unauthorized override of the controls. Accordingly, because of the inherent limitations in our control system, misstatements due to error or fraud may occur and not be detected.

We are an "emerging growth company," and we cannot be certain if the reduced reporting requirements applicable to emerging growth companies will make our common stock less attractive to investors.

We are an "emerging growth company" as defined in the Jumpstart Our Business Startups Act of 2012, as amended (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; and
- not being required to hold a non-binding advisory vote on executive compensation or obtain stockholder approval of any golden parachute payments not previously approved.

In addition, as an "emerging growth company" the JOBS Act allows us to delay adoption of new or revised accounting pronouncements applicable to public companies until such pronouncements are made applicable to private companies. We have elected to use this extended transition period under the JOBS Act. As a result, our consolidated financial statements may not be comparable to the financial statements of issuers who are required to comply with the effective dates for new or revised accounting standards that are applicable to public companies, which may make comparison of our financials to those of other public companies more difficult.

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) ending December 31, 2023 , (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.

We do not intend to pay dividends for the foreseeable future.

We have never declared nor paid cash dividends on our capital stock. We currently intend to retain any future earnings to finance the operation and expansion of our business, and we do not expect to declare or pay any dividends in the foreseeable future. Consequently, stockholders must rely on sales of their common stock after price appreciation, which may never occur, as the only way to realize any future gains on their investment.

The concentration of our stock ownership will likely limit our stockholders' ability to influence corporate matters, including the ability to influence the outcome of director elections and other matters requiring stockholder approval.

Based upon shares outstanding as of December 31, 2018, our executive officers, directors and the holders of more than 5% of our outstanding common stock, in the aggregate, beneficially owned approximately 70% of our common stock. As a result, these stockholders, acting together, will have significant influence over all matters that require approval by our stockholders, including the election of directors and approval of significant corporate transactions. Corporate actions might be taken even if other stockholders oppose them. This concentration of ownership might also have the effect of delaying or preventing a change of control of our company that other stockholders may view as beneficial.

Delaware law and provisions in our amended and restated certificate of incorporation and amended and restated bylaws could make a merger, tender offer or proxy contest difficult, thereby depressing the trading price of our common stock.

Our status as a Delaware corporation and the anti-takeover provisions of the Delaware General Corporation Law may discourage, delay or prevent a change in control by prohibiting us from engaging in a business combination with an interested stockholder for a period of three years after the person becomes an interested stockholder, even if a change of control would be beneficial to our existing stockholders. In addition, our amended and restated certificate of incorporation and amended and restated bylaws contain provisions that may make the acquisition of our company more difficult, including the following:

- a classified board of directors with three-year staggered terms, which could delay the ability of stockholders to change the membership of a majority of our board of directors;
- the ability of our board of directors to issue shares of preferred stock and to determine the price and other terms of those shares, including preferences and voting rights, without stockholder approval, which could be used to significantly dilute the ownership of a hostile acquirer;
- the exclusive right of our board of directors to elect a director to fill a vacancy created by the expansion of our board of directors or the resignation, death or removal of a director, which prevents stockholders from being able to fill vacancies on our board of directors;
- a prohibition on stockholder action by written consent, which forces stockholder action to be taken at an annual or special meeting of our stockholders;
- the requirement that a special meeting of stockholders may be called only by a majority vote of our entire board of directors, the chairman of our board of directors or our chief executive officer, which could delay the ability of our stockholders to force consideration of a proposal or to take action, including the removal of directors;

- the requirement for the affirmative vote of holders of at least 66 2/3 % of the voting power of all of the then-outstanding shares of the voting stock, voting together as a single class, to amend the provisions of our amended and restated certificate of incorporation relating to the management of our business or our amended and restated bylaws, which may inhibit the ability of an acquir e r to effect such amendments to facilitate an unsolicited takeover attempt; and
- advance notice procedures with which stockholders must comply to nominate candidates to our board of directors or to propose matters to be acted upon at a stockholders' meeting, which may discourage or deter a potential acquirer from conducting a solicitation of proxies to elect the acquirer's own slate of directors or otherwise attempting to obtain control of us.

In addition, as a Delaware corporation, we are subject to Section 203 of the Delaware General Corporation Law. These provisions may prohibit large stockholders, in particular those owning 15% or more of our outstanding voting stock, from merging or combining with us for a certain period of time. A Delaware corporation may opt out of this provision by express provision in its original certificate of incorporation or by amendment to its certificate of incorporation or bylaws approved by its stockholders. However, we have not opted out of this provision.

These and other provisions in our amended and restated certificate of incorporation, amended and restated bylaws and Delaware law could make it more difficult for stockholders or potential acquirers to obtain control of our board of directors or initiate actions that are opposed by our then-current board of directors, including delay or impede a merger, tender offer or proxy contest involving our company. The existence of these provisions could negatively affect the price of our common stock and limit opportunities for our stockholders' to realize value in a corporate transaction.

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

Our amended and restated certificate of incorporation will provide that the Court of Chancery of the State of Delaware is the exclusive forum for any derivative action or proceeding brought on our behalf, any action asserting a breach of fiduciary duty, any action asserting a claim against us arising pursuant to the Delaware General Corporation Law, our certificate of incorporation or our bylaws or any action asserting a claim against us that is governed by the internal affairs doctrine. This choice of forum provision 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 and may discourage these types of lawsuits. Alternatively, if a court were to find the choice of forum provision contained in our amended and restated certificate of incorporation to be inapplicable or unenforceable in an action, we may incur additional costs associated with resolving such action in other jurisdictions.

Item 1B. Unresolved Staff Comments

None

Item 2. Properties

We currently lease 70,100 square feet of office and laboratory space in Hayward, California under a lease that expires on October 31, 2025. We believe this this space is sufficient to meet our needs for the foreseeable future and that any additional space we may require will be available on commercially reasonable terms.

Item 3. Legal Proceedings

We are not currently a party to any material legal proceedings. From time to time, we may become involved in legal proceedings arising in the ordinary course of our business. Regardless of outcome, litigation can have an adverse impact on us due to defense and settlement costs, diversion of management resources, negative publicity, reputational harm and other factors.

Item 4. Mine Safety Disclosures

None

PART II

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

Market Information

Our common stock trades on NYSE under the symbol "RCUS."

Holders of Common Stock

As of March 1, 2019, we had approximately 139 stockholders of record as reported by our transfer agent. This does not include beneficial owners whose shares are held in street name.

Dividend Policy

We have never declared or paid cash dividends on our capital stock. We intend to retain all available funds and any future earnings, if any, to fund the development and expansion of our business and we do not anticipate paying any cash dividends in the foreseeable future. Any future determination to declare dividends will be made at the discretion of our board of directors.

Sales of Unregistered Securities

None

Use of Proceeds

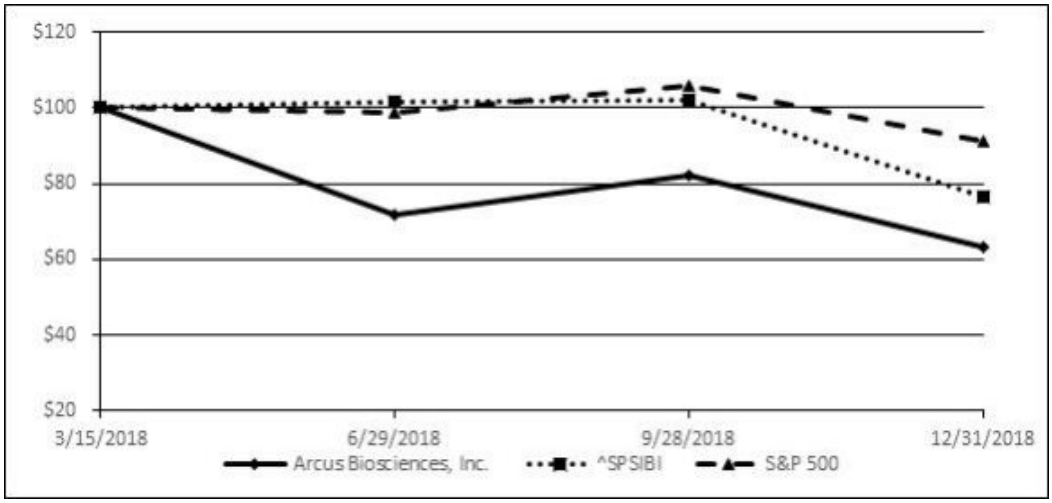
On March 14, 2018, our Registration Statements on Form S-1 (File Nos. 333-223086 and 333-223670) were declared effective by the SEC for our initial public offering of common stock, pursuant to which we sold an aggregate of 9,200,000 shares of our common stock at an initial public offering price of $15.00 per share. There has been no material change in the planned use of proceeds from our initial public offering as described in our prospectus dated March 14, 2018 filed with the SEC pursuant to Rule 424(b)(4) under the Securities Act of 1933, as amended (the Prospectus).

Issuer Purchases of Equity Securities

None

Stock Performance Graph

The following graph compares the cumulative stockholders returns from March 15, 2018 (first day of trading of our common stock), through December 31, 2018 for (i) our common stock, (ii) the S&P Biotechnology Index and (iii) S&P 500 Index, assuming $100 invested on March 15, 2018, and reinvestment of dividends if paid. The stockholder return shown on the graph below is not necessarily indicative of future performance, and we do not make or endorse any predictions as to future stockholder returns. This graph shall not be deemed "soliciting material" or be deemed "filed" for purposes of Section 18 of the Exchange Act, or otherwise subject to the liabilities under that Section, and shall not be deemed to be incorporated by reference into any of our filings under the Securities Act, whether made before or after the date hereof and irrespective of any general incorporation language in any such filing.



Item 6. Selected Financial Data

The following selected financial data should be read in conjunction with Item 7, "Management's Discussion and Analysis of Financial Condition and Results of Operations" and Item 8, "Financial Statements and Supplemental Data" of this Annual Report on Form 10-K.

	Year Ended December 31,		
(in thousands, except share and per share data)	**2018**	**2017**	**2016**
Consolidated Statements of Operations Data:			
Collaboration and license revenue	$ 8,353	$ 1,413	$ —
Operating expenses:			
Research and development (1)	49,646	47,218	14,247
General and administrative	13,566	7,636	3,935
Total operating expenses	63,212	54,854	18,182
Loss from operations	(54,859)	(53,441)	(18,182)
Non-operating income (expense), net			
Interest and other income (expense), net	4,922	775	212
Gain on deemed sale from equity method investee	1,229	—	—
Share of loss from equity method investee	(886)	(416)	—
Total non-operating income, net	5,265	359	212
Net loss	$ (49,594)	$ (53,082)	$ (17,970)
Net loss per share, basic and diluted (2)	$ (1.43)	$ (29.03)	$ (20.80)
Weighted-average number of shares used to compute basic and diluted net loss per common share	34,618,237	1,828,262	863,983

(1) $18.5 million of the 2017 research and development expenses related to licensing payments to WuXi Biologics. Please see Note 6 of our consolidated financial statements for further information on our licensing agreements.

(2) See Note 10 to our consolidated financial statements for an explanation of the calculation of our basic and diluted net loss per share.

	As of December 31,		
(in thousands)	**2018**	**2017**	**2016**
Consolidated Balance Sheet Data:			
Cash and investments	$ 259,725	$ 175,703	$ 98,896
Working capital (1)	242,013	164,143	94,145
Total assets	274,925	190,486	109,702
Convertible preferred stock	—	226,196	119,454
Accumulated deficit	(122,828)	(73,234)	(20,152)
Total stockholders' equity (deficit)	234,942	(72,328)	(19,994)

(1) We define working capital as current assets less current liabilities. See our consolidated financial statements for further details regarding our current assets and current liabilities.

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

You should read the following discussion and analysis of our financial condition and results of operations together with "Item 6. Selected Consolidated Financial Data" and our financial statements and related notes included elsewhere in this Annual Report. This discussion and other parts of this report contain forward-looking statements that involve risk and uncertainties, such as statements of our plans, objectives, expectations, and intentions. Our actual results could differ materially from those discussed in these forward-looking statements. Factors that could cause or contribute to such differences include, but are not limited to, those discussed in the section of this report titled "Risk Factors."

Overview

We are a clinical-stage biopharmaceutical company focused on creating innovative cancer immunotherapies by leveraging underexploited biological opportunities. Specifically, we target well-characterized biological pathways with significant scientific data supporting their importance in regulating the immune response against cancer and for which either there are no molecules in development or those that exist have suboptimal profiles. To exploit these pathways, we have built a robust and highly efficient discovery capability to create and optimize highly differentiated small-molecule immuno-oncology product candidates. Since our inception in 2015, we have built a broad portfolio of small-molecule and antibody product candidates that we plan to develop together as intra-portfolio combinations. Our most advanced small-molecule product candidate, AB928, an adenosine receptor antagonist, is in a Phase 1/1b program to evaluate it in combination with chemotherapy and with our anti-PD-1 antibody, AB122. We expect to report initial dose-escalation data for these combinations in the middle of 2019. We have also initiated clinical trials for our two antibody product candidates, AB122 and AB154 (our anti-TIGIT antibody), as well as a healthy volunteer trial for our fourth product candidate, AB680 (a small molecule CD73 inhibitor).

Financial Overview

Since commencing operations in 2015, we have devoted substantially all of our efforts and financial resources to building our research and development capabilities and establishing our corporate infrastructure.

To date, we have derived all of our revenue from non-refundable payments we received under the option and license agreement (the Taiho Agreement) we entered into in 2017 with Taiho Pharmaceutical Co., Ltd. (Taiho). We have not generated any revenue from product sales and we have never been profitable. We have incurred net losses since the commencement of our operations. As of December 31, 2018, we had an accumulated deficit of $122.8 million. We incurred a net loss of $49.6 million in the year ended December 31, 2018. We do not expect to generate product revenue unless and until we obtain marketing approval for and commercialize a product candidate, and we cannot assure you that we will ever generate significant revenue or profits.

To date, we have financed our operations primarily through net proceeds of $226.2 million from private placements of convertible preferred stock, net proceeds of $124.7 million from our IPO in March 2018, pursuant to which we issued 9,200,000 shares of our common stock, and $33.0 million in proceeds from the Taiho Agreement. As of December 31, 2018, we had $259.7 million of cash and investments, of which $256.5 million are cash, cash equivalents, and short-term investments. We believe that our existing cash, cash equivalents and short-term investments will be sufficient to fund our planned operations for at least the next 12 months from the date of this report. We have based this estimate on assumptions that may prove to be wrong, and we could utilize our available capital resources sooner than we expect.

We expect to incur substantial expenditures in the foreseeable future as we expand our pipeline and advance our product candidates through clinical development, the regulatory approval process and, if approved, commercial launch activities. Specifically, in the near term we expect to incur substantial expenses relating to our ongoing and planned clinical trials, including the advancement of AB928 through its Phase 1/1b program to evaluate it in combinations with chemotherapy and AB122, the development and validation of our manufacturing processes, and other development activities.

We have no manufacturing facilities, and all of our manufacturing activities are contracted out to third parties. We currently utilize third-party clinical research organizations to carry out our clinical development and trials.

We will need substantial additional funding to support our continuing operations and pursue our development strategy. Until such time that we can generate significant revenue from sales of our product candidates, if ever, we expect to finance our operations through the sale of equity, debt financings or other capital sources, including potential collaborations with other companies or other strategic transactions. Adequate funding may not be available to us on acceptable terms, or at all. If we fail to raise capital or enter into such agreements as, and when, needed, we may have to significantly delay, scale back, or discontinue the development and commercialization of our product candidates or delay our efforts to expand our product pipeline.

Taiho Option and License Agreement

In September 2017, we entered into the Taiho Agreement with Taiho to collaborate on the potential development and commercialization of certain product candidates from our portfolio in Japan and certain other territories in Asia (excluding China) (the Taiho Territory). The Taiho Agreement provides Taiho with exclusive options, over a five-year period (the Option Period), to obtain an exclusive development and commercialization license to clinical stage product candidates from our programs (each, an Arcus Program).

In consideration for the exclusive options and other rights contained in the Taiho Agreement, Taiho will make non-refundable, non-creditable cash payments to us totaling $35.0 million, of which we received $30.0 million as of December 31, 2018 and the remaining $5.0 million we expect to receive in 2019.

In the event we do not initiate IND enabling studies for at least five Arcus Programs prior to the expiration of the Option Period, Taiho may elect to extend the Option Period, up to a maximum of seven years for the Option Period, subject to an extension fee. If Taiho elects to exercise an option they will be obligated to make an exercise option payment for each option exercise of between $3.0 million to $15.0 million, depending on the development stage of the applicable Arcus Program for which the option is exercised. In addition, we are eligible to receive additional clinical and regulatory milestones totaling up to $130.0 million per Arcus Program, and will be eligible to receive contingent payments of up to $145.0 million per Arcus Program associated with the achievement of specified levels of Taiho net sales in the Taiho Territory.

In addition, we will receive royalties ranging from high single-digits to mid-teens on net sales of licensed products in the Taiho Territory. Royalties will be payable on a licensed product-by-licensed product and country-by-country basis during the period of time commencing on the first commercial sale of a licensed product in a country and ending upon the later of: (a) ten (10) years from the date of first commercial sale of such licensed product in such country; and (b) expiration of the last-to-expire valid claim of our patents covering the manufacture, use or sale or exploitation of such licensed product in such country (the Royalty Term).

In July 2018, Taiho exercised its option to our adenosine receptor antagonist program , which includes AB928 and back-up compounds, in the Taiho Territory , for a fee of $3.0 million. Upon this exercise, Taiho now has the sole responsibility for the development and commercialization of licensed products from within the program in the Taiho Territory.

WuXi Biologics License Agreement

In August 2017, we entered into a license agreement (the WuXi Agreement) with WuXi Biologics (Cayman) Inc. (WuXi Biologics) to obtain an exclusive license to develop, use, manufacture, and commercialize products including an anti-PD-1 antibody in North America, Europe, Japan and certain other territories. We made upfront and milestone payments of $18.5 million as of December 31, 2018. The WuXi Agreement also provides for [additional?] clinical and regulatory milestone payments, commercialization milestone payments of up to $375.0 million, and tiered royalty payments to be made to WuXi Biologics that range from the high single-digits to low teens of net sales by us of licensed products. However, because the achievement of these milestones is not fixed and determinable, such commitments have not been included on our consolidated balance sheet or under "—Contractual Obligations and Commitments" below. For additional information regarding future payments to third parties, including milestone and royalty payments to WuXi Biologics, please see "Item 1. Business—License Agreements."

Abmuno License Agreement

In December 2016, we entered into a license agreement (the Abmuno Agreement) with Abmuno Therapeutics LLC (Abmuno) to obtain a worldwide exclusive license to develop, use, manufacture, and commercialize products that include an anti-TIGIT antibody. We have made upfront and milestone payments of $6.6 million as of December 31, 2018. The Abmuno Agreement also provides for additional clinical, regulatory and commercialization milestone payments of up to $101.0 million. However, because the achievement of these milestones is not fixed and determinable, such commitments have not been included on our consolidated balance sheet or under "—Contractual Obligations and Commitments" below. For additional information regarding future payments to third parties, including milestone payments to Abmuno, please see "Item 1. Business—License Agreements."

Components of Operating Results

Collaboration and License Revenue

Under the Taiho Agreement, we recognize revenue from the upfront and annual payments for research and development services performed by us to develop our product candidates and from option exercise payments upon Taiho's exercise of an option during the Option Period.

Operating Expenses

Research and Development Expenses

Our research and development expenses consist of expenses incurred in connection with the research and development of our research programs. These expenses include payroll and personnel expenses, including stock-based compensation for our research and product development employees, laboratory supplies, product licenses, consulting costs, contract research, pre-clinical and clinical expenses, and depreciation. We expense both internal and external research and development costs as they are incurred. Non-refundable advance payments for services that will be used or rendered for future research and development activities are recorded as prepaid expenses and recognized as an expense as the related services are performed.

We do not allocate our costs by product candidates, as a significant amount of research and development expenses include internal costs, such as payroll and other personnel expenses, and external costs, neither of which are tracked by product candidate. In particular, with respect to internal costs, several of our departments support multiple product candidate research and development programs, and we do not allocate those costs by product candidate.

We expect our research and development expenses to increase substantially during the next few years as we seek to complete existing and initiate additional clinical trials, pursue regulatory approval for our product candidates, and advance other programs into the clinic. Over the next few years, we expect our preclinical, clinical, and contract manufacturing expenses to increase significantly relative to what we have incurred to date. Specifically, we expect in the near term to incur substantial expenses related to advancing AB928 through its Phase 1/1b program to evaluate it in combinations with chemotherapy and AB122. In addition, under our license agreements with WuXi Biologics and Abmuno, we may be required to pay additional clinical and regulatory milestone payments based on the development progress of AB122 and AB154, respectively. Predicting the timing or the final cost to complete our clinical program or validation of our manufacturing and supply processes is difficult and delays may occur because of many factors. Factors that could cause or contribute to delays or additional costs include, but are not limited to, those discussed in "Item 1A. Risk Factors."

General and Administrative Expenses

General and administrative expenses consist principally of personnel-related costs including payroll and stock-based compensation for personnel in executive, finance, human resources, business and corporate development, and other administrative functions, professional fees for legal, consulting, and accounting services, rent and other facilities costs, depreciation, and other general operating expenses not otherwise classified as research and development expenses.

We anticipate that our general and administrative expenses will continue to increase substantially during the next few years as a result of staff expansion and additional occupancy costs, as well as costs associated with being a public company, including higher legal and accounting fees, investor relations costs, higher insurance premiums and other compliance costs associated with being a public company.

Interest and Other Income (Expense), net

Interest and other income (expense), net consists primarily of interest earned on our investments including corporate notes and government agency notes.

Gain on Deemed Sale from Equity Method Investee

Gain on deemed sale from equity method investee consists of a gain related to a dilution of our investment in PACT Pharma, Inc. (PACT Pharma).

Share of Loss from Equity Method Investee

Share of loss from equity method investee consists of our share of loss recorded in conjunction with our equity method investment in PACT Pharma.

Critical Accounting Policies, Significant Judgments and Use of Estimates

Our consolidated financial statements have been prepared in accordance with U.S. generally accepted accounting principles (GAAP). The preparation of these consolidated financial statements requires us to make estimates and assumptions that affect the reported amounts of assets and liabilities and the disclosure of contingent assets and liabilities at the date of the consolidated financial statements, as well as the reported revenue and expenses incurred during the reporting periods. Our estimates are based on our 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 that the accounting policies discussed below are critical to understanding our historical and future performance, as these policies relate to the more significant areas involving management's judgments and estimates.

While our significant accounting policies are described in the notes to our consolidated financial statements, we believe that the following critical accounting policies are most important to understanding and evaluating our reported financial results.

Revenue Recognition

We generate revenue from our option and license agreement for the development and commercialization of our product candidates. Option and license agreements may include non-refundable upfront research and development fees, option fees to obtain development and commercialization licenses for our products, milestone payments based on the achievement of defined development, regulatory and sales targets, and royalties on sales of commercialized products. To date, we have not recognized revenue from sales of our products. We recognize revenue when all four of the following criteria have been met: (i) collectability is reasonably assured; (ii) delivery has occurred or services have been rendered; (iii) persuasive evidence of an arrangement exists; and (iv) the fee is fixed or determinable. Revenue under option and license arrangements is recognized based on evaluation of the performance obligations of the contract. Collectability is assessed based on evaluation of payment criteria as stated in the contract as well as the creditworthiness of the customer. Determination of whether delivery has occurred or services rendered are based on management's evaluation of the performance obligations as stated in the contract and progress made against those obligations. Evidence of an arrangement is deemed to exist upon execution of the contract. Fees are considered fixed and determinable when the amount payable to us is no longer subject to any acceptance, refund rights or other contingencies that would alter the fixed nature of the fees charged for the deliverables.

Option and license agreements may contain multiple elements as evaluated under Accounting Standards Codification (ASC) 605-25, *Revenue Recognition-Multiple-Element Arrangements,* including agreements to provide research and development services, participation in development and/or steering committees, manufacturing services, sharing of know-how and other information, and grants of licenses to develop and commercialize product candidates. Each deliverable under the agreement is evaluated to determine whether it qualifies as a separate unit of accounting based on whether the deliverable has standalone value to the customer. The arrangement's consideration that is fixed or determinable is then allocated to each separate unit of accounting based on the following hierarchy: (i) vendor-specific objective evidence of the fair value of the deliverable, if it exists; (ii) third-party evidence of selling price, if vendor-specific objective evidence is not available; or (iii) the best estimate of selling price if neither vendor-specific objective evidence or third-party evidence is available.

A delivered item or items that do not qualify as a separate unit of accounting within the arrangement are combined with the other applicable undelivered items within the arrangement. The allocation of arrangement consideration and the recognition of revenue is then determined for those combined deliverables as a single unit of accounting. For a combined unit of accounting, non-refundable upfront fees are recognized as performance obligations related to the final deliverable are completed. In the case of research and development services, performance would generally be expected to be performed ratably over the estimated performance period unless we determine there is a discernible pattern of performance other than straight-line, in which case we use a proportionate performance method to recognize the revenue over the estimated performance period. Amounts received in advance of performance are recorded as deferred revenue. If any of the initial deliverables are determined to have standalone value separate from the research and development services, then the allocated consideration is recorded as revenue when those items are delivered.

Option and license agreements may also contain milestone payments that become due upon the achievement of certain milestones. We apply ASC 605-28, *Revenue Recognition—Milestone Method* . Under the milestone method, payments that are contingent upon achievement of a substantive milestone are recognized in the period in which the milestone is achieved. Milestones are defined as an event that can only be achieved based on our performance and there is substantive uncertainty about whether the event will be achieved at the inception of the arrangement. Events that are contingent only on the passage of time or only on counterparty performance are not considered milestones subject to this guidance. Further, for the milestone to be considered substantive, the amounts received must relate solely to prior performance, be reasonable relative to all of the deliverables, and the consideration must be commensurate with our performance to achieve the milestone. Non-substantive milestone payments are recognized as revenue over the estimated period of any remaining performance obligations.

Research and Development Expenses

Research and development costs are expensed as incurred. Research and development expenses consist primarily of personnel costs for our research and product development employees. Also included are non-personnel costs such as professional fees payable to third parties for preclinical and clinical studies and research services, laboratory supplies and equipment maintenance, product licenses, and other consulting costs.

We estimate preclinical and clinical study and research expenses based on the services performed, pursuant to contracts with research institutions that conduct and manage preclinical and clinical studies and research services on our behalf. We estimate these expenses based on discussions with internal management personnel and external service providers as to the progress or stage of completion of services and the contracted fees to be paid for such services. If the actual timing of the performance of services or the level of effort varies from the original estimates, we will adjust the accrual accordingly. Payments associated with licensing agreements to acquire exclusive licenses to develop, use, manufacture and commercialize products that have not reached technological feasibility and do not have alternative future use are expensed as incurred. Payments made to third parties under these arrangements in advance of the performance of the related services by the third parties are recorded as prepaid expenses until the services are rendered.

Stock-Based Compensation Expense

We account for stock-based compensation arrangements with employees in accordance with ASC 718, *Stock Compensation* . Stock-based awards granted include stock options with time-based vesting. ASC 718 requires the recognition of compensation expense, using a fair value-based method, for costs related to all stock-based payments. Our determination of the fair value of stock options with time-based vesting on the date of grant utilizes the Black-Scholes option-pricing model, and is impacted by our common stock price as well as other variables including, but not limited to, expected term that options will remain outstanding, expected common stock price volatility over the term of the option awards, risk-free interest rates and expected dividends.

The fair value of a stock-based award is recognized over the period during which an optionee is required to provide services in exchange for the option award, known as the requisite service period (usually the vesting period) on a straight-line basis. Stock-based compensation expense is recognized based on the fair value determined on the date of grant and is reduced for forfeitures as they occur.

Equity instruments issued to non-employees are accounted for in accordance with ASC 505-50 *Equity Based Payments to Non-Employees* and are recorded at their fair value on the measurement date and are subject to periodic adjustments as the underlying equity instruments vest. The fair value of options granted to consultants is expensed when vested. Non-employee stock-based compensation expense was not material for all periods presented.

Estimating the fair value of equity-settled awards as of the grant date using valuation models, such as the Black-Scholes option pricing model, is affected by assumptions regarding a number of complex variables. Changes in the assumptions can materially affect the fair value and ultimately how much stock-based compensation expense is recognized. These inputs are subjective and generally require significant analysis and judgment to develop.

Prior to our IPO, the following estimates of fair value were obtained from an independent third-party valuation specialist to determine the fair value of our common stock on the date of grant.

Valuation Date (As of)		Fair Value per Share of Common Stock
August 15, 2016	$	1.23
May 31, 2017	$	2.58
November 1, 2017	$	5.39
February 1, 2018	$	8.95

Expected Term —We have opted to use the "simplified method" for estimating the expected term of options, whereby the expected term equals the arithmetic average of the vesting term and the original contractual term of the option (generally 10 years).

Expected Volatility —Due to our limited operating history and a lack of company specific historical and implied volatility data, we have based our estimate of expected volatility on the historical volatility of a group of similar companies that are publicly traded. The historical volatility data was computed using the daily closing prices for the selected companies' shares during the equivalent period of the calculated expected term of the stock-based awards.

Risk-Free Interest Rate —The risk-free rate assumption is based on the U.S. Treasury instruments with maturities similar to the expected term of our stock options.

Expected Dividend —We have not issued any dividends in our history and do not expect to issue dividends over the life of the options and therefore have estimated the dividend yield to be zero.

The following assumptions were used to calculate the fair value of awards granted to employees, non-employees and directors during the periods indicated:

	Year Ended		
	December 31, 2018	December 31, 2017	December 31, 2016
Risk-free interest rate	1.19%-3.05%	1.66% - 2.20%	1.2% - 2.45%
Expected term (in years)	5.16-9.95	5.95 - 9.99	6.25 - 9.84
Volatility	58.7% - 75.5%	67.0% - 71.7%	67.0% - 77.8%
Dividend yield	—%	—%	—%

We will continue to use judgment in evaluating the expected volatility, expected terms, and interest rates utilized for our stock-based compensation expense calculations on a prospective basis.

Stock-based compensation expense, net of forfeitures, is reflected in the consolidated statements of operations and comprehensive loss as follows (in thousands):

	Year Ended		
	December 31, 2018	December 31, 2017	December 31, 2016
Research and development	$ 2,255	$ 222	$ 67
General and administrative	1,619	273	23
Total stock-based compensation	$ 3,874	$ 495	$ 90

Income Taxes

We provide for income taxes under the asset and liability method. Current income tax expense or benefit represents the amount of income taxes expected to be payable or refundable for the current year. Deferred income tax assets and liabilities are determined based on differences between the financial statement reporting and tax bases of assets and liabilities and net operating loss and credit carryforwards, and are measured using the enacted tax rates and laws that will be in effect when such items are expected to reverse. Deferred income tax assets are reduced, as necessary, by a valuation allowance when management determines it is more likely than not that some or all of the tax benefits will not be realized.

We account for uncertain tax positions in accordance with ASC 740-10, *Accounting for Uncertainty in Income Taxes* . We assess all material positions taken in any income tax return, including all significant uncertain positions, in all tax years that are still subject to assessment or challenge by relevant taxing authorities. Assessing an uncertain tax position begins with the initial determination of the position's sustainability and is measured at the largest amount of benefit that is greater than fifty percent likely of being realized upon ultimate settlement. As of each balance sheet date, unresolved uncertain tax positions must be reassessed, and we will determine whether (i) the factors underlying the sustainability assertion have changed and (ii) the amount of the recognized tax benefit is still appropriate. The recognition and measurement of tax benefits requires significant judgment. Judgments concerning the recognition and measurement of a tax benefit might change as new information becomes available.

As of December 31, 2018, our total net deferred tax assets were $30.7 million. Due to our lack of earnings history and uncertainties surrounding our ability to generate future taxable income, the net deferred tax assets have been fully offset by a valuation allowance. The deferred tax assets were primarily comprised of federal and state tax net operating losses (NOLs) and research and development tax credits. Utilization of NOLs may be limited by the "ownership change" rules, as defined in Section 382 and 383 of the Internal Revenue Code of 1986, as amended, and similar state tax laws. We determined that an ownership change occurred in 2015 in conjunction with our Series A Preferred Stock financing and in 2017 in conjunction with our Series C Preferred Stock financing but do not expect that these ownership changes will result in the expiration of any the NOLs prior to utilization. Our ability to use our remaining NOLs may be further limited if we experience an ownership change in connection with future equity issuance or as a result of future changes in our stock ownership.

Results of Operations

Comparison of the Years Ended December 31, 2018 and 2017

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

	Year Ended December 31,		$ Change	% Change
	2018	2017		
Collaboration and license revenue	$ 8,353	$ 1,413	$ 6,940	*
Operating expenses:				
Research and development	49,646	47,218	2,428	5%
General and administrative	13,566	7,636	5,930	78%
Total operating expenses	63,212	54,854	8,358	15%
Loss from operations	(54,859)	(53,441)	(1,418)	3%
Non-operating income (expense):				
Interest and other income (expense), net	4,922	775	4,147	*
Gain on deemed sale from equity method investee	1,229	—	1,229	*
Share of loss from equity method investee	(886)	(416)	(470)	113%
Total non-operating income, net	5,265	359	4,906	*
Net loss	$ (49,594)	$ (53,082)	$ 3,488	-7%

* Not meaningful

Collaboration and License Revenue

Collaboration and license revenue increased $6.9 million from $1.4 million for the year ended December 31, 2017 to $8.4 million for the year ended December 31, 2018. The increase in collaboration and license revenue was due to the Taiho Agreement we entered into in September 2017, consisting of $5.3 million recognized from the ongoing research funded in part through the non-refundable, non-creditable upfront payments and $3.0 million recognized from Taiho's exercise of its option to our adenosine receptor antagonist program.

Research and Development Expenses

Research and development expenses increased $2.4 million, or 5%, from $47.2 million for the year ended December 31, 2017 to $49.6 million for the year ended December 31, 2018. The increase in research and development expenses was primarily due to an increase of $12.3 million in manufacturing and clinical costs related to all four of our programs in clinical trials and their associated manufacturing costs, an increase of $4.2 million in employee compensation costs due to additional headcount, an increase of $2.0 million in stock-based compensation, an increase of $0.8 million in depreciation expense related to increases in lab equipment, an increase of $0.7 million in lab supplies, and an increase of $0.6 million in facilities and office expenses . Those increases were partially offset by a decrease of $18.6 million in product license expense, which primarily consisted of upfront and milestone payments made during the year ended December 31, 2017 pursuant to our WuXi Agreement.

General and Administrative Expenses

General and administrative expenses increased $5.9 million, or 78%, from $7.6 million for the year ended December 31, 2017 to $13.6 million for the year ended December 31, 2018. The increase in general and administrative expenses was primarily due to an increase of $1.5 million in legal and accounting fees as a public company, an increase of $1.4 million in employee compensation costs due to additional headcount, an increase of $1.4 million in stock-based compensation and an increase of $1.3 million in facilities and office expenses due to our expanded facilities and higher insurance premiums.

Interest and Other Income (Expense), Net

Interest and other income, net increased $4.1 million from $0.8 million for the year ended December 31, 2017 to $4.9 million for the year ended December 31, 2018. The increase was primarily due to a $4.0 million increase in interest income from higher cash and investment balances and higher yields.

Gain on Deemed Sale from Equity Method Investee

Gain on deemed sale from equity method investee was $1.2 million for the year ended December 31, 2018 due to a gain recorded in conjunction with PACT Pharma's Series B convertible preferred financing in May 2018 in which we did not participate.

Share of Loss from Equity Method Investee

Share of loss from equity method investee increased $0.5 million from $0.4 million for the year ended December 31, 2017 to $0.9 million for the year ended December 31, 2018. The increase was primarily due to larger operating losses at PACT Pharma.

Comparison of the Years Ended December 31, 2017 and 2016

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

	Year Ended December 31,		$ Change	% Change
	2017	2016		
Collaboration and license revenue	$ 1,413	$ —	$ 1,413	*
Operating expenses:				
Research and development	47,218	14,247	32,971	231%
General and administrative	7,636	3,935	3,701	94%
Total operating expenses	54,854	18,182	36,672	202%
Loss from operations	(53,441)	(18,182)	(35,259)	194%
Non-operating income (expense):				
Interest and other income (expense), net	775	212	563	266%
Share of loss from equity method investee	(416)	—	(416)	*
Total non-operating income, net	359	212	147	*
Net loss	$ (53,082)	$ (17,970)	$ (35,112)	195%

* Not meaningful

Collaboration and License Revenue

Collaboration and license revenue of $1.4 million for the year ended December 31, 2017 was entirely due to the revenue we recognized during the period from the Taiho Agreement we entered into in September 2017. We had no collaboration and license revenue for the year ended December 31, 2016.

Research and Development Expenses

Research and development expenses increased $33.0 million, or 231%, from $14.2 million for the year ended December 31, 2016 to $47.2 million for the year ended December 31, 2017. The increase in research and development expenses was primarily due to upfront and milestone payments of $18.5 million made to WuXi Biologics, an increase of $6.4 million in clinical, pre-clinical, and manufacturing costs related to the initiation of our clinical trials for AB928 and AB122 during the year ended December 31, 2017, an increase of $4.8 million in personnel costs as a result of an increase in our employee headcount, an increase of $2.2 million in lab supplies and non-capitalized equipment, and an increase of $0.5 million in depreciation.

General and Administrative Expenses

General and administrative expenses increased $3.7 million, or 94%, from $3.9 million for the year ended December 31, 2016 to $7.6 million for the year ended December 31, 2017. The increase in general and administrative expenses was primarily due to an increase of $1.6 million in personnel costs as a result of an increase in our employee headcount, an increase of $0.7 million in depreciation, an increase of $0.4 million in office related expenses, and an increase of $0.4 million in legal and accounting fees.

Interest and Other Income (Expense), Net

Interest and other income, net increased $0.6 million, or 266%, from $0.2 million for the year ended December 31, 2016 to $0.8 million for the year ended December 31, 2017. The increase was primarily due to an increase in interest income of $0.6 million.

Share of Loss from Equity Method Investee

Share of loss from equity method investee was $0.4 million for the year ended December 31, 2017 related to our share of operating losses at PACT Pharma.

Liquidity and Capital Resources

To date, we have financed our operations primarily through net proceeds of $226.2 million from private placements of convertible preferred stock, net proceeds of $124.7 million from our IPO in March 2018, pursuant to which we issued 9,200,000 shares of our common stock, and $33.0 million in proceeds from the Taiho Agreement. As of December 31, 2018, we had $259.7 million of cash and investments, of which $256.5 million are cash, cash equivalents, and short-term investments. Our cash and investments are held in a variety of interest-bearing instruments, including money market funds, and investments in corporate notes, other debt securities, commercial papers and government agency obligations.

Based on our existing business plan, we believe that our existing cash, cash investments, and short-term investments will be sufficient to fund our anticipated level of operations through at least the next 12 months following the filing date of this report.

We will continue to require additional capital to develop our product candidates and fund operations for the foreseeable future. We may seek to raise capital through private or public equity or debt financings, collaborative or other arrangements with other companies, or through other sources of financing. Adequate additional funding may not be available to us on acceptable terms or at all. Our failure to raise capital as and when needed could have a negative impact on our financial condition and our ability to pursue our business strategies. We anticipate that we will need to raise substantial additional capital, the requirements of which will depend on many factors, including:

- the scope, rate of progress and costs of our drug discovery, preclinical development activities, laboratory testing and clinical trials for our product candidates;
- the number and scope of clinical programs we decide to pursue;
- the scope and costs of manufacturing development and commercial manufacturing activities;
- the timing and amount of milestone payments we receive under the Taiho Agreement;
- the extent to which we acquire or in-license other product candidates and technologies;
- the cost, timing and outcome of regulatory review of our product candidates;
- the cost and timing of establishing sales and marketing capabilities, if any of our product candidates receive marketing approval;
- the costs of preparing, filing and prosecuting patent applications, maintaining and enforcing our intellectual property rights and defending intellectual property-related claims;
- our ability to establish and maintain collaborations on favorable terms, if at all;

- our efforts to enhance operational systems and our ability to attract, hire and retain qualified personnel, including personnel to support the development of our product candidates;
- the costs associated with being a public company; and
- the cost associated with commercializing our product candidates, if they receive marketing approval.

If we raise additional funds by issuing equity securities, our stockholders may experience dilution. Any future debt financing into which we enter may impose upon us additional covenants that restrict our operations, including limitations on our ability to incur liens or additional debt, pay dividends, repurchase our common stock, make certain investments and engage in certain merger, consolidation or asset sale transactions. Any debt financing or additional equity that we raise may contain terms that are not favorable to us or our stockholders. If we are unable to raise additional funds when needed, we may be required to delay, reduce, or terminate some or all of our development programs and clinical trials. We may also be required to sell or license to others rights to our product candidates in certain territories or indications that we would prefer to develop and commercialize ourselves.

Summary Consolidated Statement of Cash Flows

The following table sets forth the primary sources and uses of cash and cash equivalents for each of the periods presented below (in thousands):

	Year Ended December 31,		
	2018	2017	2016
Net cash (used in) provided by:			
Operating activities	$ (42,996)	$ (25,059)	$ (12,944)
Investing activities	(113,440)	(49,071)	(38,861)
Financing activities	129,074	107,396	70,100
Net increase (decrease) in cash and cash equivalents	$ (27,362)	$ 33,266	$ 18,295

Cash Used in Operating Activities

Net cash used in operating activities was $43.0 million for the year ended December 31, 2018, $25.1 million for the year ended December 31, 2017 and $12.9 million for the year ended December 31, 2016.

Cash used in operating activities in the year ended December 31, 2018 was primarily due to our net loss for the period of $49.6 million, and was affected by non-cash charges relating to stock-based compensation expense of $3.9 million, depreciation and amortization of $3.7 million , non-cash discount accretion of $1.8 million related to our cash and investments , a non-cash gain of $1.2 million relating to our equity method investee, and changes in operating assets and liabilities, including an increase in accounts payable and accrued liabilities of $3.4 million, and an increase in prepaid expenses of $1.2 million.

Cash used in operating activities in the year ended December 31, 2017 was primarily due to our net loss for the period of $53.1 million and was also affected by changes in operating assets and liabilities, including an increase in deferred revenue of $23.6 million, an increase in accounts payable and accrued liabilities of $1.3 million, and non-cash charges relating to depreciation and amortization and stock-based compensation expense of $3.1 million.

Cash used in operating activities in the year ended December 31, 2016 was primarily due to our net loss for the period of $18.0 million and was also affected by changes in operating assets and liabilities, including an increase in prepaid expenses, other current assets and long-term assets that totaled $0.8 million, an increase in accounts payable and accrued liabilities of $4.4 million, and non-cash depreciation and amortization expense of $1.3 million.

Cash Used in Investing Activities

Cash used in investing activities was $113.4 million for the year ended December 31, 2018, primarily related to the net purchase of investments of $109.7 million, and purchases of property and equipment of $3.7 million.

Cash used in investing activities was $49.1 million in the year ended December 31, 2017, primarily related to the purchase of investments of $43.6 million, and purchases of property and equipment of $5.5 million.

Cash used in investing activities was $38.9 million in the year ended December 31, 2016, primarily related to the purchase of investments of $33.8 million, purchases of property and equipment of $4.1 million, and our $1.0 million equity investment in PACT Pharma, a related party.

Cash Provided by Financing Activities

Cash provided by financing activities was $129.1 million for the year ended December 31, 2018, which consisted primarily of net proceeds of $125.1 million from our IPO (approximately $0.4 million of IPO costs were paid in 2017) and net proceeds of $4.0 million from the exercise of our common stock options.

Cash provided by financing activities was $107.4 million in the year ended December 31, 2017, which consisted primarily of net proceeds of $106.9 million from the issuance and sale of shares of our Series C convertible preferred stock (approximately $0.1 million of accrued financing costs were paid in 2018).

Cash provided by financing activities was $70.1 million in the year ended December 31, 2016, which consisted primarily of net proceeds of $69.8 million from the issuance and sale of shares of our Series B convertible preferred stock.

Contractual Obligations and Commitments

The following table summarizes our contractual obligations as of December 31, 2018 (in thousands):

	Payments due by period				
	Less than 1 year	2 to 3 years	4 to 5 years	After 5 years	Total
Operating lease obligations	$ 2,041	$ 4,300	$ 4,605	$ 4,487	$ 15,432

As of December 31, 2018, we had obligations consisting of operating leases for our operating facilities for approximately 70,100 square feet. Under the terms of the agreements, we will have lease obligations consisting of $15.4 million in payments from 2019 through 2025.

We enter into contracts in the normal course of business with third party contract organizations for clinical trials, non-clinical studies and testing, manufacturing, and other services and products for operating purposes. These contracts generally provide for termination following a certain period after notice, and therefore we believe that our non-cancelable obligations under these agreements are not material and they are not included in the table above.

We have not included milestone or royalty payments or other contractual payment obligations in the table above if the timing and amount of such obligations are unknown or uncertain.

Off-Balance Sheet Arrangements

Since our inception, we have not engaged in any off-balance sheet arrangements, as defined in the rules and regulations of the SEC.

Agreements with PACT Pharma

In September 2016, we purchased approximately 3.6 million shares of common stock of PACT Pharma, a privately funded, early-stage biopharmaceutical company focused on adoptive cell therapy. We determined the fair value of such investment to be insignificant given the start-up nature of PACT Pharma's operations, and it was recorded at a nominal amount. In December 2016, we and PACT Pharma entered into a Master Services Agreement (the PACT Agreement) under which we provide PACT Pharma with general administrative support, including finance, human resources, legal, and other operational support. We also received certain warrants to purchase PACT Pharma common stock exercisable upon PACT Pharma's achievement of certain valuation thresholds pursuant to the PACT Agreement. Also in December 2016, we purchased 1.0 million shares of Series A preferred stock of PACT Pharma for $1.0 million. Our investment in PACT Pharma is accounted for as an equity method investment, and as a result we record our share of PACT Pharma's operating results in our consolidated statements of operations and comprehensive loss. For the year ended December 31, 2018 and 2017, we recorded $0.9 million and $0.4 million, respectively relating to our share of PACT Pharma's operating loss. For the year ended December 31, 2016, our share of PACT Pharma's operating results was not significant. We monitor the investment for events or circumstances indicative of potential other-than-temporary impairment and make appropriate reductions in carrying values if we determine that an impairment charge is required. For the years ended December 31, 2018, 2017 and 2016, no impairment charge was recorded. See Note 5 to our consolidated financial statements included elsewhere in this Annual Report on Form 10-K for further discussion of our equity investment in PACT Pharma.

JOBS Act Accounting Election

The Jumpstart Our Business Startups Act of 2012 (the JOBS Act), permits an "emerging growth company" such as us to take advantage of an extended transition period to comply with new or revised accounting standards applicable to public companies. We are choosing to elect the extended transition period for complying with new or revised accounting standards pursuant to Section 107(b) of the JOBS Act until the earlier of the date we (i) are no longer an emerging growth company or (ii) affirmatively and irrevocably opt out of the extended transition period provided in the JOBS Act. As a result, our financial statements may not be comparable to companies that comply with new or revised accounting pronouncements as of public company effective dates.

We will remain an emerging growth company until the earliest of (1) the last day of our first fiscal year (a) ending December 31, 2023, (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 $700.0 million of the prior June 30th and (2) the date on which we have issued more than $1.0 billion in non-convertible debt securities during the prior three-year period.

Recent Accounting Pronouncements

See "Recent Accounting Pronouncements" in Note 2, "Summary of Significant Accounting Policies" in the Notes to Consolidated Financial Statements for a discussion of recently adopted accounting pronouncements and accounting pronouncements not yet adopted, and their expected impact on our financial position and results of operations.

Item 7A. Quantitative and Qualitative Disclosures About Market Risk

The market risk inherent in our financial instruments and in our financial position represents the potential loss arising from adverse changes in interest rates or exchange rates. As of December 31, 2018, we had cash, cash equivalents, short-term and long-term investments of $259.7 million, consisting of interest-bearing money market accounts, and investments in corporate notes and government agency securities, for which the fair market value would be affected by changes in the general level of United States interest rates. However, due to the short-term maturities and the low-risk profile of our investments, an immediate 10% change in interest rates would not have a material effect on the fair market value of our cash, cash equivalents and investments.

In addition, we are also exposed to foreign currency exchange rate risk inherent in our contracts with research institutions and contract research organizations as certain services are performed by them outside the United States. We have payments due to Australian vendors in foreign currency. A significant movement in the Australian dollar may have a material impact on our financial position in the future.

We do not believe that inflation, interest rate changes, or exchange rate fluctuations had a significant impact on our results of operations for any periods presented herein.

Item 8. Financial Statemen ts and Supplementary Data

ARCUS BIOSCIENCES, INC.

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REPORT OF INDEPENDENT REGIS TERED PUBLIC ACCOUNTING FIRM

To the Stockholders and the Board of Directors of
Arcus Biosciences, Inc.

Opinion on the Financial Statements

We have audited the accompanying consolidated balance sheets of Arcus Biosciences, Inc. (the Company) as of December 31, 2018 and 2017, the related consolidated statements of operations and comprehensive loss, consolidated statements of convertible preferred stock and stockholders' equity (deficit), and cash flows for each of the three years in the period ended December 31, 2018, and the related notes (collectively referred to as the "consolidated financial statements"). In our opinion, the consolidated financial statements present fairly, in all material respects, the consolidated financial position of the Company at December 31, 2018 and 2017, and the consolidated results of its operations and its cash flows for each of the three years in the period ended December 31, 2018, in conformity with U.S. generally accepted accounting principles.

Basis for Opinion

These financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on the Company's financial statements based on our 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/ Ernst & Young LLP

We have served as the Company's auditor since 2016.

Redwood City, California
March 5, 2019

ARCUS BIOSCIENCES, INC.
Consolidated Balance Sheets
(In thousands, except share and per share amounts)

	December 31, 2018	December 31, 2017
ASSETS		
Current assets:		
Cash and cash equivalents	$ 71,064	$ 98,426
Short-term investments	185,480	77,277
Prepaid expenses and other current assets	2,321	1,141
Amounts owed by a related party	83	25
Total current assets	258,948	176,869
Long-term investments	3,181	—
Property and equipment, net	11,107	11,230
Equity investment in related party	1,202	682
Restricted cash	203	203
Other long-term assets	284	1,502
Total assets	$ 274,925	$ 190,486
LIABILITIES		
Current liabilities:		
Accounts payable	$ 3,102	$ 3,820
Accrued liabilities	6,023	3,137
Deferred revenue, current	6,250	5,000
Other current liabilities	1,560	769
Total current liabilities	16,935	12,726
Deferred revenue, noncurrent	16,984	18,587
Deferred rent	4,272	4,740
Other long-term liabilities	1,792	565
Total liabilities	39,983	36,618
Commitments (Note 12)		
Convertible preferred stock, $0.0001 par value, no shares and 120,958,867 shares authorized as of December 31, 2018 and 2017, respectively; no shares and 30,459,574 shares issued and outstanding as of December 31, 2018 and 2017, respectively	—	226,196
Stockholders' equity (deficit):		
Preferred stock, $0.0001 par value, 10,000,000 shares authorized as of December 31, 2018; no shares issued and outstanding	—	—
Common stock, $0.0001 par value, 400,000,000 and 153,993,227 shares authorized as of December 31, 2018 and 2017, respectively; 44,537,946 and 4,090,898 shares issued and outstanding as of December 31, 2018 and 2017, respectively	4	—
Additional paid-in capital	357,873	948
Accumulated deficit	(122,828)	(73,234)
Accumulated other comprehensive loss	(107)	(42)
Total stockholders' equity (deficit)	234,942	(72,328)
Total liabilities, convertible preferred stock and stockholders' equity	$ 274,925	$ 190,486

The accompanying notes are an integral part of these Consolidated Financial Statements

ARCUS BIOSCIENCES, INC.
Consolidated Statements of Operations and Comprehensive Loss
(In thousands, except share and per share amounts)

	Years Ended December 31,		
	2018	2017	2016
Collaboration and license revenue	$ 8,353	$ 1,413	$ —
Operation expenses:			
Research and development	49,646	47,218	14,247
General and administrative	13,566	7,636	3,935
Total operating expenses	63,212	54,854	18,182
Loss from operations	(54,859)	(53,441)	(18,182)
Non-operating income (expense):			
Interest and other income (expense), net	4,922	775	212
Gain on deemed sale from equity method investee	1,229	—	—
Share of loss from equity method investee	(886)	(416)	—
Total non-operating income, net	5,265	359	212
Net loss	(49,594)	(53,082)	(17,970)
Other comprehensive loss	(65)	(16)	(26)
Comprehensive loss	$ (49,659)	$ (53,098)	$ (17,996)
Net loss per share, basic and diluted	$ (1.43)	$ (29.03)	$ (20.80)
Weighted-average number of shares used to compute basic and diluted net loss per share	34,618,237	1,828,262	863,983

The accompanying notes are an integral part of these Consolidated Financial Statements

ARCUS BIOSCIENCES, INC.
Consolidated Statements of Convertible Preferred Stock and Stockholders' Equity (Deficit)
(In thousands, except share and per share amounts)

	Convertible Preferred Stock		Common stock		Additional Paid-In	Accumulated	Accumulated Other Comprehensive	Total Stockholders'
	Shares	Amount	Shares	Amount	Capital	Deficit	Loss	Deficit
Balance at December 31, 2015	12,556,791	$ 49,637	2,798,146	$ —	$ 11	$ (2,182)	$ —	$ (2,171)
Issuance of Series B convertible preferred	8,750,852	69,817	—	—	—	—	—	—
Vesting of early exercised stock options	—	—	137,050	—	63	—	—	63
Stock-based compensation	—	—	—	—	90	—	—	90
Other comprehensive loss	—	—	—	—	—	—	(26)	(26)
Issuance of common stock upon exercise of stock options, net of amounts related to unvested shares	—	—	47,576	—	20	—	—	20
Net loss	—	—	—	—	0	(17,970)	—	(17,970)
Balance at December 31, 2016	21,307,643	119,454	2,982,772	—	184	(20,152)	(26)	(19,994)
Issuance of Series C convertible preferred	9,151,931	106,742	—	—	—	—	—	—
Vesting of early exercised stock options and restricted stock	—	—	269,752	—	235	—	—	235
Stock-based compensation	—	—	—	—	495	—	—	495
Other comprehensive loss	—	—	—	—	—	—	(16)	(16)
Issuance of common stock upon exercise of stock options, net of amounts related to unvested shares	—	—	25,605	—	34	—	—	34
Net loss	—	—	—	—	—	(53,082)	—	(53,082)
Balance at December 31, 2017	30,459,574	226,196	3,278,129	—	948	(73,234)	(42)	(72,328)
Conversion of preferred stock to common stock	(30,459,574)	(226,196)	30,459,574	3	226,195	—	—	226,198
Issuance of common stock upon IPO			9,200,000	1	124,734	—	—	124,735
Issuance of common stock upon exercise of stock options, net of amounts related to unvested shares	—	—	67,349	—	95	—	—	95
Vesting of early exercised stock options and restricted stock	—	—	528,374	—	1,276	—	—	1,276
Issuance of common stock under Employee Stock Purchase Plan	—	—	77,397	—	751	—	—	751
Stock-based compensation	—	—	—	—	3,874	—	—	3,874
Other comprehensive loss	—	—	—	—	—		(65)	(65)
Net loss	—	—	—	—	—	(49,594)	—	(49,594)
Balance at December 31, 2018	—	$ —	43,610,823	$ 4	$ 357,873	$ (122,828)	$ (107)	$ 234,942

The accompanying notes are an integral part of these Consolidated Financial Statements

ARCUS BIOSCIENCES, INC.
Consolidated Statements of Cash Flows
(In thousands)

	Years Ended December 31,		
	2018	**2017**	**2016**
Cash flow from operating activities			
Net loss	$ (49,594)	$ (53,082)	$ (17,970)
Adjustments to reconcile net loss to net cash used in operating activities:			
Stock-based compensation expense	3,874	495	90
Depreciation and amortization	3,664	2,612	1,314
Share of loss from equity method investee	886	416	—
Gain on deemed sale from equity method investee	(1,229)	—	—
(Accretion of discounts) amortization of premiums on investments	(1,752)	—	—
Other non-operating income	(177)	(98)	—
Changes in operating assets and liabilities			
Amounts owed by a related party	(58)	380	—
Prepaid expenses and other current assets	(1,180)	(751)	(602)
Other long-term assets	(80)	(6)	(200)
Accounts payable	(69)	(267)	3,569
Accrued liabilities	3,497	1,582	808
Other current liabilities	43	(136)	647
Deferred revenue	(353)	23,587	—
Deferred rent	(468)	209	(600)
Net cash used in operating activities	(42,996)	(25,059)	(12,944)
Cash flow from investing activities			
Purchases of short-term and long-term investments	(261,552)	(96,830)	(33,762)
Proceeds from maturities of short-term and long-term investments	151,855	53,273	—
Purchases of property and equipment	(3,743)	(5,514)	(4,099)
Investment in related party	—	—	(1,000)
Net cash used in investing activities	(113,440)	(49,071)	(38,861)
Cash flow from financing activities			
Proceeds from initial public offering, net of issuance costs	125,111	—	—
Proceeds from issuance of preferred stock, net of issuance costs	—	106,877	69,817
Proceeds from issuance of common stock upon exercise of stock options, net of repurchases	4,098	892	283
Deferred initial public offering costs	—	(373)	—
Payment of preferred stock issuance costs	(135)	—	—
Net cash provided by financing activities	129,074	107,396	70,100
Net decrease in cash and cash equivalents	(27,362)	33,266	18,295
Cash and cash equivalents at beginning of period	98,426	65,160	46,865
Cash and cash equivalents at end of period	$ 71,064	$ 98,426	$ 65,160
Non-cash investing and financing activities:			
Unpaid financing cost included in accounts payable and accrued liabilities	$ —	$ 1,058	$ —
Unpaid portion of property and equipment purchases included in accounts payable and accrued liabilities	136	338	618
Vesting of early exercised stock options and restricted stock	$ 1,276	$ 235	$ 63

The accompanying notes are an integral part of these Consolidated Financial Statements

Note 1. Organization

Description of Business

Arcus Biosciences, Inc. (Company) is a clinical-stage biopharmaceutical company focused on creating innovative cancer immunotherapies by leveraging underexploited biological opportunities. Specifically, the Company targets well-characterized biological pathways with significant scientific data supporting their importance in regulating the immune response against cancer and for which either there are no molecules in development or those that exist have suboptimal profiles. To exploit these pathways, the Company has built a robust and highly efficient discovery capability to create and optimize highly differentiated small-molecule immuno-oncology product candidates. Since its inception in 2015, the Company has built a broad portfolio of small molecule and antibody product candidates that it plans to develop together as intra-portfolio combinations.

Initial Public Offering

On March 21, 2018, the Company completed its initial public offering (IPO) pursuant to which the Company issued 9,200,000 shares of common stock, including the exercise of the underwriters' overallotment option to purchase 1,200,000 shares of common stock, at an offering price at $15.00 per share. The Company received aggregate net proceeds of approximately $124.7 million after deducting underwriting discounts and other offering related costs. In addition, in connection with the completion of the Company's IPO, all outstanding shares of convertible preferred stock were converted into 30,459,574 shares of common stock, and the Company amended and restated its certificate of incorporation and bylaws, which, among other things, changed the authorized capital stock to 400,000,000 shares of common stock and 10,000,000 shares of preferred stock, each with a par value of $0.0001 per share.

Note 2. Summary of Significant Accounting Policies

Basis of Presentation

The consolidated financial statements and accompanying notes have been prepared in accordance with generally accepted accounting principles in the United States of America (U.S. GAAP) and include all adjustments necessary for the fair presentation of the Company's financial position for the periods presented.

Principles of Consolidation

During 2017, the Company established a wholly-owned subsidiary in Australia. The consolidated financial statements include the Company's accounts and those of its wholly-owned subsidiary. All intercompany accounts, transactions and balances have been eliminated.

Reverse Stock Split

On March 9, 2018, the Company effected a reverse split of all shares of its common and preferred stock at a ratio of 1-for-3.96 (the Reverse Split). The par values and the authorized shares of the common and preferred stock were not adjusted as a result of the Reverse Split. All references to shares of common stock outstanding, average number of shares outstanding and per share amounts in these consolidated financial statements and notes to the consolidated financial statements have been adjusted within the consolidated financial statements, on a retroactive basis, to reflect the Reverse Split .

Use of Estimates

The preparation of the Company's consolidated financial statements in conformity with U.S. GAAP requires management to make estimates and assumptions that affect the reported amounts of assets, liabilities, revenues and expenses, as well as related disclosure of contingent assets and liabilities. Estimates were used to determine the fair value of common stock prior to the IPO and are used to determine stock-based awards and other issuances, accruals for research and development costs, useful lives of long-lived assets, and uncertain tax positions. Actual results could differ materially from the Company's estimates.

Risk and Uncertainties

The Company's future results of operations involve a number of risks and uncertainties. Factors that could affect the Company's future operating results and cause actual results to vary materially from expectations include, but are not limited to, uncertainty of results of clinical trials and reaching milestones, uncertainty of regulatory approval of the Company's potential drug candidates, uncertainty of market acceptance of the Company's product candidates, competition from substitute products and larger companies, securing and protecting proprietary technology, strategic relationships and dependence on key individuals and sole source suppliers.

The Company's product candidates require approvals from the U.S. Food and Drug Administration (FDA) and comparable foreign regulatory agencies prior to commercial sales in their respective jurisdictions. There can be no assurance that any product candidates will receive the necessary approvals. If the Company does not obtain approval and does not successfully commercialize any of its product candidates, it would have a materially adverse impact on the Company.

Segments

The Company operates and manages its business as one reportable and operating segment, which is the business of developing and commercializing immunotherapies. The Company's chief executive officer, who is the chief operating decision maker, reviews financial information on an aggregate basis for purposes of allocating and evaluating financial performance. All long-lived assets are maintained in the United States of America.

Cash Equivalents, Short-Term and Long-Term Investments

Cash equivalents include marketable securities having an original maturity of three months or less at the time of purchase. Short-term investments have maturities of greater than three months at the time of purchase. Long-term investments have maturities greater than 12 months at the time of purchase. Collectively, cash equivalents, short-term and long-term investments are considered available-for-sale and are recorded at fair value. Unrealized gains and losses are recorded in accumulated other comprehensive loss. Realized gains and losses are included in interest and other income, net in the consolidated statements of operations and comprehensive loss. The basis on which the cost of a security sold or amount reclassified out of accumulated other comprehensive income into earnings is determined using the specific identification method.

Restricted Cash

Restricted cash at December 31, 2018 and 2017 comprises cash balances primarily held as security in connection with the Company's facility lease agreement and is included in long-term assets in the consolidated balance sheets.

Receivable From a Related Party

Receivable from a related party is recorded net of any allowances. As of December 31, 2018 and 2017, the outstanding amount is due from PACT Pharma, Inc. (PACT Pharma) for expenses the Company paid for on its behalf. The Company is exposed to credit risk in the event of a default by PACT Pharma. To date, the Company has not experienced any losses related to these receivables (see Note 5) and has not recorded any allowances.

Fair Value Measurements

Fair value accounting is applied for all financial assets and liabilities, including short-term and long-term investments, and non-financial assets and liabilities that are recognized or disclosed at fair value in the consolidated financial statements on a recurring basis (at least annually). The carrying amount of the Company's financial instruments, including receivable from a related party, accounts payable and accrued expenses and other current liabilities approximate fair value due to their short-term maturities.

Concentration of Credit Risk

Cash equivalents, short-term and long-term investments are financial instruments that potentially subject the Company to concentrations of credit risk. The Company invests in money market funds, treasury bills and notes, government bonds, commercial paper and corporate notes. The Company limits its credit risk associated with cash equivalents, short-term and long-term investments by placing them with banks and institutions it believes are highly credit worthy and in highly rated investments.

Property and Equipment

Property and equipment are stated at cost and depreciated using the straight-line method over the estimated useful lives of the assets, ranging from one to five years. Leasehold improvements are amortized over the shorter of their estimated useful lives or the related lease term. Upon retirement or sale, the cost and related accumulated depreciation are removed from the consolidated balance sheet and the resulting gain or loss is reflected in the consolidated statement of operations and comprehensive loss.

Impairment of Long-Lived Assets

The Company reviews long-lived assets, including property and equipment, for impairment whenever events or changes in business circumstances indicate that the carrying amount of the assets may not be fully recoverable. An impairment charge would be recorded when estimated undiscounted future cash flows expected to result from the use of the asset and its eventual disposition are less than its carrying amount. Impairment, if any, is assessed using discounted cash flows or other appropriate measures of fair value. The Company did not recognize any impairment charges for the years ended December 31, 2018 and 2017.

Deferred Offering Costs

Deferred offering costs associated with the Company's IPO, consisting of legal, accounting, filing and other fees directly related to the IPO, were capitalized. The deferred offering costs, which totaled $3.6 million, were reclassified to additional paid-in capital upon the effectiveness of the IPO in March 2018. As of December 31, 2017, $1.3 million of deferred offering costs were capitalized and included in other long-term assets in the consolidated balance sheet.

Revenue Recognition

The Company generates revenue from its option and license agreement for the development and commercialization of its product candidates. Option and license agreements may include non-refundable upfront research and development fees, option fees to obtain development and commercialization licenses for the Company's products, milestone payments based on achievement of defined development, regulatory and sales targets, and royalties on sales of commercialized products. To date, the Company has not recognized revenue from sales of its product candidates.

The Company recognizes revenue when all four of the following criteria have been met: (i) collectability is reasonably assured; (ii) delivery has occurred or services have been rendered; (iii) persuasive evidence of an arrangement exists; and (iv) the fee is fixed or determinable. Revenue under option and license arrangements is recognized based on evaluation of the performance obligations of the contract. Collectability is assessed based on evaluation of payment criteria as stated in the contract as well as the creditworthiness of the customer. Determination of whether delivery has occurred, or services rendered are based on management's evaluation of the performance obligations as stated in the contract and progress made against those obligations. Evidence of an arrangement is deemed to exist upon execution of the contract. Fees are considered fixed and determinable when the amount payable to the Company is no longer subject to any acceptance, refund rights or other contingencies that would alter the fixed nature of the fees charged for the deliverables.

Option and license agreements may contain multiple elements as evaluated under Accounting Standards Codification (ASC) 605-25, *Revenue Recognition-Multiple-Element Arrangements,* including agreements to provide research and development services, participation in development and/or steering committees, manufacturing services, sharing of know-how and other information, and grants of licenses to develop and commercialize product candidates. Each deliverable under the agreement is evaluated to determine whether it qualifies as a separate unit of accounting based on whether the deliverable has standalone value to the customer. The arrangement's consideration that is fixed or determinable is then allocated to each separate unit of accounting based on the following hierarchy: (i) vendor-specific objective evidence of the fair value of the deliverable, if it exists; (ii) third-party evidence of selling price, if vendor-specific objective evidence is not available; or (iii) the best estimate of selling price if neither vendor-specific objective evidence or third-party evidence is available.

A delivered item or items that do not qualify as a separate unit of accounting within the arrangement are combined with the other applicable undelivered items within the arrangement. The allocation of arrangement consideration and the recognition of revenue is then determined for those combined deliverables as a single unit of accounting. For a combined unit of accounting, non-refundable upfront fees are recognized as performance obligations related to the final deliverable are completed. In the case of research and development services, performance would generally be expected to be ratable over the estimated performance period unless the Company determines there is a discernible pattern of performance other than straight-line, in which case the Company uses a proportionate performance method to recognize the revenue over the estimated performance period. Amounts received in advance of performance are recorded as deferred revenue. If any of the initial deliverables are determined to have standalone value separate from the research and development services, then the allocated consideration is recorded as revenue when those items are delivered.

Options to acquire development and commercialization licenses of the Company's products are evaluated to determine if they are substantive. Fees for substantive options are recognized as revenue when an option is exercised by the collaboration partner and the Company has completed the deliverables that are associated with exercise of such option.

Option and license agreements may also contain milestone payments that become due upon the achievement of certain milestones. The Company applies ASC 605-28, *Revenue Recognition—Milestone Method.* Under the milestone method, payments that are contingent upon achievement of a substantive milestone are recognized in the period in which the milestone is achieved. Milestones are defined as an event that can only be achieved based on the Company's performance and there is substantive uncertainty about whether the event will be achieved at the inception of the arrangement. Events that are contingent only on the passage of time or only on counterparty performance are not considered milestones subject to this guidance. Further, for the milestone to be considered substantive, the amounts received must relate solely to prior performance, be reasonable relative to all of the deliverables, and the consideration must be commensurate with the Company's performance to achieve the milestone. Non-substantive milestone payments are recognized as revenue over the estimated period of any remaining performance obligations.

Research and Development Expenses

Research and development costs are expensed as incurred. Research and development expenses consist primarily of personnel costs for the Company's research and product development employees. Also included are non-personnel costs such as professional fees payable to third parties for preclinical and clinical studies and research services, laboratory supplies and equipment maintenance, product licenses, and other consulting costs.

The Company estimates preclinical and clinical study and research expenses based on the services performed, pursuant to contracts with research institutions that conduct and manage preclinical and clinical studies and research services on its behalf. The Company estimates these expenses based on discussions with internal management personnel and external service providers as to the progress or stage of completion of services and the contracted fees to be paid for such services. If the actual timing of the performance of services or the level of effort varies from the original estimates, the Company will adjust the accrual accordingly. Payments associated with licensing agreements to acquire exclusive licenses to develop, use, manufacture and commercialize products that have not reached technological feasibility and do not have alternative future use are expensed as incurred. Payments made to third parties under these arrangements in advance of the performance of the related services by the third parties are recorded as prepaid expenses until the services are rendered.

Leases and Rent Expense

The Company records rent expense on a straight-line basis over the life of the lease. In cases where there is a free rent period or future fixed rent escalations, the Company records a deferred rent liability. Additionally, the receipt of any lease incentives is recorded as a deferred rent liability which is amortized over the lease term as a reduction of rent expense. Any lease incentives that are due from the landlord but have not been collected are recorded as a receivable in Prepaid expenses and other current assets. Building improvements made with the lease incentives or tenant allowances are capitalized as leasehold improvements and included in property and equipment in the consolidated balance sheets.

Stock-Based Compensation

The Company accounts for stock-based compensation arrangements with employees in accordance with ASC 718, *Stock Compensation.* Stock-based awards granted include stock options with time-based vesting. ASC 718 requires the recognition of compensation expense, using a fair value-based method, for costs related to all stock-based payments. The Company's determination of the fair value of stock options with time-based vesting on the date of grant utilizes the Black-Scholes option-pricing model, and is impacted by its common stock price as well as other variables including, but not limited to, expected term that options will remain outstanding, expected common stock price volatility over the term of the option awards, risk-free interest rates and expected dividends.

The fair value of a stock-based award is recognized over the period during which an optionee is required to provide services in exchange for the option award, known as the requisite service period (usually the vesting period) on a straight-line basis. Stock-based compensation expense is recognized based on the fair value determined on the date of grant and is reduced for forfeitures as they occur.

Equity instruments issued to non-employees are accounted for in accordance with ASC 505-50, *Equity Based Payments to Non-Employees* , and are recorded at their fair value on the measurement date and are subject to periodic adjustments as the underlying equity instruments vest. The fair value of options granted to consultants is expensed when vested. Non-employee stock-based compensation expense was not material for all periods presented.

Estimating the fair value of equity-settled awards as of the grant date using valuation models, such as the Black-Scholes option pricing model, is affected by assumptions regarding a number of complex variables. Changes in the assumptions can materially affect the fair value and ultimately how much stock-based compensation expense is recognized. These inputs are subjective and generally require significant analysis and judgment to develop.

Convertible Preferred Stock

The Company records all shares of convertible preferred stock at their respective fair values less issuance costs on the dates of issuance. The convertible preferred stock is recorded outside of stockholders' equity (deficit) because, in the event of certain deemed liquidation events considered not solely within the Company's control, such as a merger, acquisition and sale of all or substantially all of the Company's assets, the convertible preferred stock will become redeemable at the option of the holders. In the event of a change of control of the Company, proceeds received from the sale of such shares will be distributed in accordance with the liquidation preferences set forth in the Company's Amended and Restated Certificate of Incorporation unless the holders of convertible preferred stock have converted their shares of convertible preferred stock into shares of common stock. The Company has determined not to adjust the carrying values of the convertible preferred stock to the liquidation preferences of such shares because of the uncertainty of whether or when such an event would occur. All of outstanding convertible preferred stock converted into common stock in March 2018 upon the effectiveness of the IPO.

Income Taxes

The Company provides for income taxes under the asset and liability method. Current income tax expense or benefit represents the amount of income taxes expected to be payable or refundable for the current year. Deferred income tax assets and liabilities are determined based on differences between the financial statement reporting and tax bases of assets and liabilities and net operating loss and credit carryforwards, and are measured using the enacted tax rates and laws that will be in effect when such items are expected to reverse. Deferred income tax assets are reduced, as necessary, by a valuation allowance when management determines it is more likely than not that some or all of the tax benefits will not be realized.

The Company accounts for uncertain tax positions in accordance with ASC 740-10, *Accounting for Uncertainty in Income Taxes.* The Company assesses all material positions taken in any income tax return, including all significant uncertain positions, in all tax years that are still subject to assessment or challenge by relevant taxing authorities. Assessing an uncertain tax position begins with the initial determination of the position's sustainability and is measured at the largest amount of benefit that is greater than fifty percent likely of being realized upon ultimate settlement. As of each balance sheet date, unresolved uncertain tax positions must be reassessed, and the Company will determine whether (i) the factors underlying the sustainability assertion have changed and (ii) the amount of the recognized tax benefit is still appropriate. The recognition and measurement of tax benefits requires significant judgment. Judgments concerning the recognition and measurement of a tax benefit might change as new information becomes available.

The Company includes any penalties and interest expense related to income taxes as a component of other expense and interest expense, net, as necessary.

Comprehensive Loss

Comprehensive loss is defined as a change in equity of a business enterprise during a period, resulting from transactions from non-owner sources. The Company had unrealized loss from its available-for-sale securities during the years ended December 31, 2018, 2017 and 2016, which meets the criteria as other comprehensive loss and, therefore, the Company has reported comprehensive loss and net loss.

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, without consideration for potentially dilutive securities. Diluted net loss per share is computed by dividing the net loss by the weighted-average number of common shares and potentially dilutive securities outstanding for the period. For purposes of the diluted net loss per share calculation, convertible preferred stock, and common stock options are considered to be potentially dilutive securities. Because the Company reported a net loss for the years ended December 31, 2018, 2017 and 2016, and the inclusion of the potentially dilutive securities would be antidilutive, diluted net loss per share is the same as basic net loss per share for all periods.

Recent Accounting Pronouncements

From time to time, new accounting pronouncements are issued by the Financial Accounting Standards Board (FASB), or other standard setting bodies and adopted by the Company as of the specified effective date. Unless otherwise discussed, the impact of recently issued standards that are not yet effective will not have a material impact on the Company's consolidated financial statements upon adoption. Under the Jumpstart Our Business Startups Act of 2012, as amended (the JOBS Act), the Company meets the definition of an emerging growth company, and has elected the extended transition period for complying with new or revised accounting standards pursuant to Section 107(b) of the JOBS Act. The Company did not adopt any new accounting standards during 2018.

Recently Issued Accounting Standards or Updates Not Yet Effective

In May 2014, the FASB issued ASU No. 2014-09, *Revenue from Contracts with Customers (Topic 606)* (ASU 2014-09). The FASB issued numerous updates that provide clarification on a number of specific issues as well as requiring additional disclosures. Collectively, the new revenue standards became effective for public business entities for fiscal years beginning after December 15, 2017, and interim periods within those fiscal years. As a result of the Company having elected the extended transition period for complying with new or revised accounting standards pursuant to Section 107(b) of the JOBS Act, ASU 2014-09 will be effective for the Company for the year ended December 31, 2019, and all interim periods thereafter. Early adoption is permitted. ASU 2014-09 also permits two methods of adoption: retrospectively to each prior reporting period presented (full retrospective method), or retrospectively with the cumulative effect of initially applying the guidance recognized at the date of initial application (the modified retrospective method).

The core principle of ASU 2014-09 is that an entity should recognize revenue when it transfers promised goods or services to customers in an amount that reflects the consideration to which the entity expects to be entitled in exchange for those goods or services. ASU 2014-09 defines a five-step process to achieve this core principle and, in doing so, it is possible more judgment and estimates may be required within the revenue recognition process than required under existing U.S. generally accepted accounting pronouncements. The Company has substantially completed its evaluation related to the adoption of ASU 2014-09, applying the five-step model of the new standard to the option and license agreement with Taiho Pharmaceutical Co., Ltd. (Taiho), the only agreement which will be impacted by the adoption of the new standard, specifically as it pertains to the non-refundable, non-creditable upfront cash payments to the Company totaling $35.0 million, the option exercise payment of $3.0 million and all other future contingent payments the Company may become entitled to. The Company will finalize its accounting assessment and quantitative impact of the adoption during the first quarter of fiscal year 2019, using the modified retrospective method, which will reflect the cumulative effect of the adoption retrospectively as of January 1, 2019, the initial date of adoption.

In January 2016, the FASB issued ASU *No. 2016-01 (Subtopic 825-10), Financial Instruments (ASU 2016-01)* . ASU 2016-01 requires management to measure marketable investments at fair value with changes in fair value recognized in net income or loss. ASU 2016-01 will impact the disclosure and presentation of financial assets and liabilities. ASU 2016-01 was effective for public business entities for fiscal years beginning after December 15, 2017, and interim periods within those fiscal years. As a result of the Company having elected the extended transition period for complying with new or revised accounting standards pursuant to Section 107(b) of the JOBS Act, ASU 2016-01 will be effective for the Company as of December 31, 2019, and all interim periods within. Early adoption is not permitted. The adoption of this standard is not expected to have a material impact on the Company's consolidated financial statements.

In February 2016, the FASB issued ASU *No. 2016-02 (Topic 842), Leases (ASU 2016-02).* ASU 2016-02 requires an entity to recognize assets and liabilities arising from a lease for both financing and operating leases. The ASU will also require new qualitative and quantitative disclosures to help investors and other financial statement users better understand the amount, timing, and uncertainty of cash flows arising from leases. For public entities, ASU 2016-02 is effective for fiscal years beginning after December 15, 2018. As a result of the Company having elected the extended transition period for complying with new or revised accounting standards pursuant to Section 107(b) of the JOBS Act, ASU 2016-02 is effective for the Company for the year ended December 31, 2020, and all interim periods within. Early adoption is permitted. The Company has not yet determined the potential effects of this ASU on its consolidated financial statements.

In November 2016, the FASB issued ASU *No. 2016-18 (Topic 230), Restricted Cash, Statement of Cash Flows (ASU 2016-18)* . ASU 2016-18 requires that a statement of cash flows explain the change during the period in the total of cash and, cash equivalents, and amounts generally described as restricted cash or restricted cash equivalents. Therefore, amounts generally described as restricted cash and restricted cash equivalents should be included with cash and cash equivalents when reconciling the beginning-of-period and end-of-period total amounts shown on the consolidated statement of cash flows. ASU 2016-18 was effective for public business entities for fiscal years beginning after December 15, 2017, and interim periods within those fiscal years. As a result of the Company having elected the extended transition period for complying with new or revised accounting standards pursuant to Section 107(b) of the JOBS Act, ASU 2016-18 will be effective for the Company for the year ended December 31, 2019, and all interim periods thereafter. Early adoption is permitted. The amendments in this ASU should be applied using a retrospective transition method to each period presented. The adoption of this standard is not expected to have a material impact on the Company's consolidated financial statements.

In June 2018, the FASB issued ASU *No. 2018-07 (Topic 718), Compensation – Stock Compensation (ASU 2018-07).* ASU 2018-07 requires an entity to expand the scope of Topic 718 to include share-based payment transactions for acquiring goods and services from nonemployees. For public entities, ASU 2018-07 is effective for fiscal years beginning after December 15, 2018. As a result of the Company having elected the extended transition period for complying with new or revised accounting standards pursuant to Section 107(b) of the JOBS Act, ASU 2018-07 is effective for the Company for the year ended December 31, 2020, and all interim periods within. Early adoption is permitted. The Company has not yet determined the potential effects of this ASU on its consolidated financial statements.

In August 2018, the FASB issued *ASU No.2018-13 (Topic 820), Fair Value Measurement.* ASU 2018-13 modifies the disclosure requirements on fair value measurement in Topic 820. For public entities, ASU 2018-013 is effective for fiscal years beginning after December 15, 2019. As a result of the Company having elected the extended transition period for complying with new or revised accounting standards pursuant to Section 107(b) of the JOBS Act, ASU 2018-13 is effective for the Company for the year ended December 31, 2020, and all interim periods within. Early adoption is permitted. The adoption of this standard is not expected to have a material impact on the Company's consolidated financial statements.

Note 3. Fair Value Measurements

Financial assets and liabilities are recorded at fair value. The accounting guidance for fair value provides a framework for measuring fair value, clarifies the definition of fair value and expands disclosures regarding fair value measurements. Fair value is defined as the price that would be received to sell an asset or paid to transfer a liability (an exit price) in an orderly transaction between market participants at the reporting date. The accounting guidance establishes a three-tiered hierarchy, which prioritizes the inputs used in the valuation methodologies in measuring fair value as follows:

Level 1—Inputs are unadjusted, quoted prices in active markets for identical assets or liabilities at the measurement date.

Level 2—Inputs (other than quoted market prices included in Level 1) are either directly or indirectly observable for the asset or liability through correlation with market data at the measurement date and for the duration of the instrument's anticipated life.

Level 3—Inputs reflect management's best estimate of what market participants would use in pricing the asset or liability at the measurement date. Consideration is given to the risk inherent in the valuation technique and the risk inherent in the inputs to the model.

Assets and liabilities measured at fair value are classified in their entirety based on the lowest level of input that is significant to the fair value measurement. The Company's assessment of the significance of a particular input to the fair value measurement in its entirety requires management to make judgments and consider factors specific to the asset or liability.

During the periods presented, the Company has not changed the manner in which it values assets and liabilities that are measured at fair value. The Company recognizes transfers between levels of the fair value hierarchy as of the end of the reporting period. There were no transfers within the hierarchy as of December 31, 2018 and 2017. The following tables set forth the Company's financial instruments that were measured at fair value on a recurring basis by level within the fair value hierarchy (in thousands):

	Fair Value Measurements at December 31, 2018			
	Total	Level 1	Level 2	Level 3
Assets				
Money market funds	$ 45,017	$ 45,017	$ —	$ —
U.S. government agency obligations	103,940	—	103,940	—
Corporate securities and commercial paper	110,768	—	110,768	—
	$ 259,725	$ 45,017	$ 214,708	$ —

	Fair Value Measurements at December 31, 2017			
	Total	Level 1	Level 2	Level 3
Assets				
Money market funds	$ 66,478	$ 66,478	$ —	$ —
U.S. government agency obligations	57,153	—	57,153	—
Corporate securities and commercial paper	52,072	—	52,072	—
	$ 175,703	$ 66,478	$ 109,225	$ —

Classified as (with contractual maturities):

	December 31, 2018	December 31, 2017
Cash and cash equivalents	$ 71,064	$ 98,426
Short-term investments (due within one year)	185,480	77,277
Long-term investments (due between one and two years)	3,181	—
	$ 259,725	$ 175,703

The investments are classified as available-for-sale marketable securities. At December 31, 2018 and 2017, the balance in the Company's accumulated other comprehensive loss comprised activity related to the Company's available-for-sale marketable securities. There were no realized gains or losses recognized on the sale or maturity of available-for-sale marketable securities as of December 31, 2018 and 2017, and as a result, the Company did not reclassify any amounts out of accumulated other comprehensive loss for the periods then ended. The Company has a limited number of available-for-sale marketable securities in loss positions as of December 31, 2018, which the Company does not intend to sell and has concluded it will not be required to sell before recovery of the amortized cost for the investment at maturity (in thousands).

	Fair Value Measurements at December 31, 2018			
	Amortized Cost	Unrealized Gain	Unrealized Loss	Fair Value
Money market funds	$ 45,017	$ —	$ —	$ 45,017
U.S. government agency obligations	103,957	—	(17)	103,940
Corporate securities and commercial paper	110,859	—	(91)	110,768
	$ 259,833	$ —	$ (108)	$ 259,725

	Fair Value Measurements at December 31, 2017			
	Amortized Cost	Unrealized Gain	Unrealized Loss	Fair Value
Money market funds	$ 66,478	$ —	$ —	$ 66,478
U.S. government agency obligations	57,183	—	(30)	57,153
Corporate securities and commercial paper	52,084	—	(12)	52,072
	$ 175,745	$ —	$ (42)	$ 175,703

Note 4. Consolidated Balance Sheet Components

Property and Equipment

Property and equipment, net consisted of the following (in thousands):

	As of December 31, 2018	As of December 31, 2017
Scientific equipment	$ 6,628	$ 5,053
Furniture and equipment	813	625
Capitalized software	146	131
Leasehold improvements	10,828	9,280
Construction in progress	335	119
Total	18,750	15,208
Less: Accumulated depreciation and amortization	(7,643)	(3,978)
Property and equipment, net	$ 11,107	$ 11,230

Depreciation and amortization expense was $3.7 million and $2.6 million for the years ended December 31, 2018 and 2017, respectively.

Accrued Liabilities

Accrued liabilities consisted of the following (in thousands):

	As of December 31, 2018	As of December 31, 2017
Accrued personnel expenses	$ 2,833	$ 1,026
Accrued research and development expenses	2,816	1,193
Professional fees	211	706
Other	163	212
Total	$ 6,023	$ 3,137

Note 5: Equity Investment

In September 2016, the Company purchased approximately 3.6 million shares of common stock of PACT Pharma, Inc. (PACT Pharma), a privately funded, early-stage biopharmaceutical company focused on adoptive cell therapy. The Company determined the fair value of such investment to be insignificant to the Company's 2016 financial statements given the start-up nature of operations of PACT Pharma, and it was recorded at a nominal amount. In December 2016, the Company and PACT Pharma entered into a Master Services Agreement (the PACT Agreement) under which the Company provided PACT Pharma with general administrative support, including finance, human resources, legal, and other operational support. The Company also received certain warrants to purchase PACT Pharma common stock exercisable upon PACT Pharma's achievement of certain valuation thresholds pursuant to the PACT Agreement. Also, in December 2016, the Company purchased 1.0 million shares of Series A preferred stock of PACT Pharma for $1.0 million. The Company determined PACT Pharma to be a variable interest entity, and that the Company has a variable interest in PACT. However, because the Company is not the primary beneficiary of PACT Pharma, it is not consolidating the results of operations of PACT Pharma in its consolidated financial statements.

The Company's investment in PACT Pharma is accounted for as an equity method investment, and as a result the Company records its share of PACT Pharma's operating results in share of loss from equity method investee in its consolidated statement of operations and comprehensive loss.

For the years ended December 31, 2018 and 2017, the Company recorded $0.9 million and $0.4 million, respectively relating to its share of PACT Pharma's operating loss. As of December 31, 2018 and 2017, the Company had a $0.1 million and $25,000 receivable from PACT Pharma, respectively, for expenses the Company paid for on its behalf.

In May 2018, PACT Pharma closed its Series B convertible preferred stock financing. The Company did not participate in this financing and therefore its equity ownership percentage in PACT Pharma decreased. As a result of the dilution in its equity ownership percentage and an increase in PACT Pharma's estimated fair value per share, the Company recorded a gain of $1.2 million in gain on deemed sale from equity method investee during the year ended December 31, 2018 and an increase in the fair value of the investment balance in the consolidated balance sheet as of December 31, 2018 by the same amount. The PACT Agreement also expired in accordance with its terms at the closing of PACT Pharma's Series B convertible preferred stock financing.

The Company monitors the investment for events or circumstances indicative of potential other-than-temporary impairment and makes appropriate reductions in carrying values if it is determined that an impairment charge is required. As of December 31, 2018 and 2017, no impairment charge was recorded. For the years ended December 31, 2018 and 2017, the Company also determined the fair value of the warrants to be insignificant to the consolidated financial statements.

Note 6. License and Collaboration Agreements

Taiho Pharmaceutical Co., Ltd

In September 2017, the Company and Taiho entered into an option and license agreement (the Taiho Agreement) to collaborate on the potential development and commercialization of certain product candidates from the Company's portfolio in Japan and certain other territories in Asia (excluding China) (the Taiho Territory). The Taiho Agreement provides Taiho with exclusive options, over a five-year period (the Option Period), to obtain an exclusive development and commercialization license to clinical stage product candidates from the Company's programs (each, an Arcus Program).

In consideration for the exclusive options and other rights contained in the Taiho Agreement, Taiho will make non-refundable, non-creditable cash payments to the Company totaling $35.0 million, of which the Company received $25.0 million during 2017. An additional $5.0 million was received in October 2018 and the remaining $5.0 million is expected to be received in 2019.

In the event that the Company has not initiated IND enabling studies for at least five Arcus Programs prior to the expiration of the Option Period, Taiho may elect to extend the Option Period, up to a maximum of seven years for the Option Period, subject to an extension fee. If Taiho elects to exercise an option they will be obligated to make an exercise option payment for each option exercise of between $3.0 million to $15.0 million, dependent on the development stage of the applicable Arcus Program for which the option is exercised. In addition, the Taiho Agreement provides that the Company is eligible to receive additional clinical and regulatory milestones totaling up to $130.0 million per Arcus Program, and it will be eligible to receive contingent payments of up to $145.0 million per Arcus Program associated with the achievement of specified levels of Taiho net sales in the Taiho Territory.

In addition, the Company will receive royalties ranging from high single-digits to mid-teens on net sales of licensed products in the Taiho Territory. Royalties will be payable on a licensed product-by-licensed product and country-by-country basis during the period of time commencing on the first commercial sale of a licensed product in a country and ending upon the later of: (a) ten (10) years from the date of first commercial sale of such licensed product in such country; and (b) expiration of the last-to-expire valid claim of the Company's patents covering the manufacture, use or sale or exploitation of such licensed product in such country (the Royalty Term).

The Taiho Agreement contains multiple elements, and the deliverables under the Taiho Agreement consist of (1) the research and development services, in which the Company will use commercially reasonable efforts to initiate IND enabling studies for at least five Arcus Programs, as well as further develop such Arcus Programs during the term of the Agreement, and (2) the obligation to participate on the joint steering committee. These deliverables are non-contingent in nature. The Company determined that the obligation to participate in the joint steering committee does not have stand-alone value to Taiho because the committee's primary purpose is to monitor and govern the research and development activities and, hence, it is inseparable from the research and development services.

The Company determined that the level of effort required for it to meet its obligations under the Taiho Agreement is not expected to vary significantly over the Company's performance period. Accordingly, the Company combined these deliverables into a single unit of accounting and allocated the entire arrangement consideration to that combined unit of accounting. As a result, the $25.0 million non-refundable, non-creditable cash payments received by the Company in 2017 is being recognized ratably over the estimated performance period of five years, the $5.0 million non-refundable, non-creditable cash payment received by the Company in 2018 is being recognized ratably over the estimated performance period of four years and the remaining $5.0 million of non-refundable, non-creditable cash payments will be recognized ratably over the estimated remaining performance period as it becomes due and payable by Taiho.

The Company also concluded that, at the inception of the agreement, Taiho's exclusive options are substantive and that they are contingent deliverables as the exclusive options have significant uncertainty and are outside of the control of the Company, since Taiho has sole discretion to determine whether or not to exercise such options. Further, the Company concluded that the exclusive options do not contain a significant and incremental discount. In July 2018, Taiho exercised its option to the Company's adenosine receptor antagonist program for a fee of $3.0 million, which was recognized by the Company as revenue during the year ended December 31, 2018. Upon this option exercise, Taiho now has the sole responsibility for the development and commercialization of licensed products from within the program in the Taiho Territory.

The Company also determined that the clinical and regulatory milestone payments under the Taiho Agreement do not constitute substantive milestones and, therefore, will not be accounted for under the milestone method of revenue recognition. The events leading to these payments do not meet the definition of a substantive milestone because the achievement of these events depends primarily on Taiho's performance. Accordingly, any revenue from these payments would be recognized over the remaining period of the performance obligations, if any, relating to this arrangement. If there are no remaining performance obligations under the arrangement at the time the milestone payment is triggered, then such milestone payment will be recognized as revenue in full upon the triggering event being achieved. As of December 31, 2018, no clinical and regulatory milestones had been achieved.

During the years ended December 31, 2018 and 2017, the Company recognized a total of $8.3 million and $1.4 million, respectively, of revenue under the Taiho Agreement. As of December 31, 2018, the Company recorded as deferred revenue, current and deferred revenue, noncurrent of $6.3 million and $17.0 million, respectively, in its consolidated balance sheet. As of December 31, 2017, the Company recorded as deferred revenue, current and deferred revenue, noncurrent of $5.0 million and $18.6 million, respectively, in its consolidated balance sheet.

The Company considers the contingent payments due from Taiho upon the achievement of specified sales volumes to be similar to royalty payments. The Company will recognize royalty payments as revenue in the period when such royalty payments are earned, i.e. in the period when sales of the licensed products in Taiho Territory occur. The Taiho Agreement shall remain in effect until (a) expiration of the last exercise period if Taiho has not exercised any of its exclusive options prior to such expiration or (b) if Taiho has exercised any of its exclusive options prior to the expiration of the applicable exercise period, expiry of all Royalty Terms for the licensed products, in each case subject to certain exceptions.

WuXi Biologics License Agreement

In August 2017, the Company entered into a license agreement (the WuXi Agreement) with WuXi Biologics (Cayman) Inc. (WuXi Biologics) in which it obtained an exclusive license to develop, use, manufacture, and commercialize products including an anti-PD-1 antibody in North America, Europe, Japan and certain other territories. The Company paid upfront and milestone payments of $18.5 million during 2017 which were recorded within research and development expenses, as the products had not reached technological feasibility and did not have alternative future. No milestone payments were made during the year ended December 31, 2018. The WuXi Agreement also provides for clinical and regulatory milestone payments, commercialization milestone payments of up to $375.0 million, and tiered royalty payments to be made to WuXi Biologics that range from the high single-digits to low teens of net sales by the Company of licensed products.

Abmuno License Agreement

In December 2016, the Company entered into a license agreement (the Abmuno Agreement) with Abmuno Therapeutics LLC (Abmuno) in which it obtained a worldwide exclusive license to develop, use, manufacture, and commercialize products that include an anti-TIGIT antibody. The Company made milestone payments of $2.8 million for the year ended December 31, 2018 and upfront and milestone payments of $3.8 million for the year ended December 31, 2017, which were recorded within research and development expenses, as the products have not reached technological feasibility and do not have alternative future use and were expensed as incurred. The Abmuno Agreement also provides for additional clinical, regulatory and commercialization milestone payments of up to $101.0 million as of December 31, 2018.

Note 7: Stockholders' Equity (Deficit)

The Company's Certificate of Incorporation, as amended and restated, authorizes the Company to issue 410,000,000 shares of capital stock consisting 400,000,000 shares common stock and 10,000,000 shares of preferred stock, both par value of $0.0001.

As of December 31, 2018 and 2017, the Company had reserved common stock, on an if-converted basis, for issuance as follows:

	December 31, 2018	December 31, 2017
Common stock options issued and outstanding	1,458,080	544,116
Convertible preferred stock	—	30,459,574
Remaining shares available for issuance under 2015 & 2018 Stock Plan	3,801,191	1,855,240
Total	5,259,271	32,858,930

Note 8: Convertible Preferred Stock

As of December 31, 2018, the Company has no outstanding convertible preferred stock. In connection with the completion of the Company's IPO in March 2018, all outstanding shares of convertible preferred stock converted into 30,459,574 shares of common stock.

As of December 31, 2017, the outstanding convertible preferred stock was as follows (in thousands, except share amounts):

	Shares Authorized	Shares Issued and Outstanding	Liquidation Value	Carrying Value
Series A	49,725,000	12,556,791	$ 49,725	$ 49,637
Series B	34,653,462	8,750,852	70,000	69,817
Series C	36,580,405	9,151,931	107,000	106,742
Total	120,958,867	30,459,574	$ 226,725	$ 226,196

Prior to their conversion, the significant rights and preferences of the convertible preferred stock were as follows:

Dividends —The holders of the convertible preferred stock are entitled to receive dividends, out of assets legally available prior and in preference to any declaration or payment of any other dividends, at the rates of $0.24, $0.48 and $0.71 per share (as adjusted for stock splits, stock dividends, reclassifications, and the like) per annum on each outstanding share of Series A, Series B and Series C convertible preferred stock, respectively, when, as and if, declared by the board of directors. Such dividends are not cumulative. No dividends were declared or paid as of the conversion upon our IPO.

Liquidation Preference — In the event of any liquidation, dissolution, or winding up of the Company, either voluntary or involuntary, the holders of Series A, Series B and Series C preferred stock shall be entitled to receive on a pari passu basis and in preference to any distribution to the common shareholders, the greater of their stated liquidation preference or the amount such holders would have received had they converted their preferred stock into common stock immediately prior to such dissolution. For each series of convertible preferred stock, the stated liquidation preference per share is equal to $3.96, $8.00 and $11.6915 per share, respectively, plus any declared but unpaid dividends. Any remaining assets shall be distributed among the holders of common stock pro rata, based on the number of shares of common stock held by each.

Voting Rights — Each share of convertible preferred stock is entitled to one vote for each share of common stock into which such share of convertible preferred stock is convertible.

Conversion — Each share of convertible preferred stock is convertible, at the option of the holder, into the number of shares of common stock that result from dividing the applicable original share price per share by the applicable conversion price per share at the time of conversion, as adjusted for stock splits, stock dividends, reclassification and the like. At the conversion date March 15, 2018, the conversion price equaled the original share.

Note 9: Stock-Based Compensation

In May 2015, the Company adopted the 2015 Stock Plan, which was amended and restated in November 2015 (as amended from time to time, the 2015 Plan).

In March 2018, the Company adopted the 2018 Equity Incentive Plan (2018 Plan), which replaced the 2015 Plan upon completion of the IPO. 3,570,000 shares were reserved under the 2018 Plan plus 709,558 shares remaining available for issuance under the Company's 2015 Plan and outstanding awards under its 2015 Plan that subsequently expire, lapse unexercised or are forfeited to or repurchased by the Company. As of December 31, 2018, the Company had 3,801,191 shares of common stock remain available for grant. In addition, the number of shares reserved for issuance under our 2018 Plan will automatically increase on January 1 of each year beginning January 1, 2019 by a number equal to the smallest of (i) 3,570,000 shares, (ii) 4% of the shares of common stock outstanding on the last business day of the prior fiscal year or (iii) the number of shares determined by our board of directors.

In March 2018, the Company adopted the 2018 Employee Stock Purchase Plan (2018 ESPP). The 2018 ESPP provides eligible employees with the opportunity to purchase shares of common stock through payroll deductions at a price equal to 85% of the lower of the fair market value per share on the first trading day of the applicable 24-month offering period or the fair market value per share on the applicable purchase date, provided that no more than 3,000 shares of common stock may be purchased by an employee on any purchase date. Also, the value of the shares purchased in any calendar year may not exceed $25,000. The 2018 ESPP is intended to constitute an "employee stock purchase plan" under Section 423(b) of the Internal Revenue Code of 1986, as amended. The 2018 ESPP may be terminated by the Company's board of directors at any time. A total of 714,000 shares of common stock were initially reserved for issuance under the 2018 ESPP, and the number of shares reserved for issuance under the 2018 ESPP will automatically increase on January 1 of each year beginning on January 1, 2019 by a number of shares equal to the least of (i) 1% of our outstanding shares of common stock on the last day of the prior fiscal year, (ii) 1,071,000 shares or (iii) a number of shares determined by our board of directors.

The terms of the 2015 Plan permitted option holders to exercise stock options before they vest, subject to certain limitations. Such unvested shares are subject to repurchase by the Company at the original exercise price in the event the option holder's service to the Company is terminated either voluntarily or involuntarily. As a result of early exercises under the 2015 Plan, approximately 927,123 and 812,769 shares had not vested and were subject to repurchase as of December 31, 2018 and 2017, respectively. The Company treats cash received from the exercise of unvested options as a refundable deposit and classifies such amounts as a liability in its consolidated balance sheets. As of December 31, 2018 and 2017, the Company included cash received for the early exercise of unvested options of $2.8 million and $0.9 million, respectively, in other current and long-term liabilities, based on the timing of their expected vesting. Amounts included in liabilities are transferred into common stock and additional paid-in capital as the shares vest, which is generally over a period of 48 months.

The following table, which includes options granted under the 2015 Plan, 2018 Plan and the Non-Plan Option, summarizes option activity:

	Shares Available for Grant	Shares Subject to Outstanding Options	Weighted Average Exercise Price Per Share	Weighted Average Remaining Contractual Term (in years)
Balance at December 31, 2015	871,226	20,200	$ 0.40	8.79
Options authorized	1,133,987	—		
Options granted	(746,825)	746,825	$ 0.59	
Options exercised	—	(637,107)	$ 0.48	
Options repurchased	24,987	—	$ 0.40	
Balance at December 31, 2016	1,283,375	129,918	$ 1.20	9.84
`Options authorized	1,568,397	—		
Options granted	(1,063,019)	1,063,019	$ 1.61	
Options exercised	—	(643,024)	$ 1.45	
Options forfeited or canceled	5,797	(5,797)	$ 1.28	
Options repurchased	60,690	—	$ 0.49	
Balance at December 31, 2017	1,855,240	544,116	$ 1.71	9.28
Options authorized	3,570,000			
Options granted	(1,645,489)	1,645,489	$ 8.19	
Options exercised	—	(720,756)	$ 4.64	
Options forfeited or canceled	10,769	(10,769)	$ 5.25	
Options repurchased	10,671			
Balance at December 31, 2018	3,801,191	1,458,080	$ 7.55	8.99
Options outstanding and exercisable as of December 31, 2018		238,721	$ 6.49	8.87
Options vested and expected to vest as of December 31, 2018		1,458,080	$ 7.55	8.99

The following table summarizes employee and non-employee stock-based compensation expense for the years ended December 31, 2018, 2017 and 2016, and also the allocation within the consolidated statements of operations and comprehensive loss (in thousands):

	Year Ended December 31, 2018	Year Ended December 31, 2017	Year Ended December 31, 2016
Research and development	$ 2,255	$ 222	$ 67
General and administrative	1,619	273	23
Total stock-based compensation	$ 3,874	$ 495	$ 90

The Company estimates the fair value of options and ESPP shares utilizing the Black-Scholes option pricing model, which is dependent upon several variables, such as expected term, volatility, risk-free interest rate, and expected dividends. Each of these inputs is subjective and generally requires significant judgment to determine. Stock-based compensation is measured at the grant date based on the fair value of the award and is recognized as expense, net of forfeitures, over the requisite service period, which is generally the vesting period of the respective award. The Company recognizes compensation on a straight-line basis over the requisite vesting period for each award. The following assumptions were used to calculate the fair value of stock-based compensation as of December 31, 2018, 2017 and 2016:

	Stock Options			ESPP
	Year Ended December 31, 2018	Year Ended December 31, 2017	Year Ended December 31, 2016	Year Ended December 31, 2018
Risk-free interest rate	1.2% - 3.1%	1.66% - 2.20%	1.2% - 2.45%	2.11% - 2.63%
Expected term (in years)	5.16-9.95	5.95-9.99	6.25-9.84	.5-2.0
Volatility	58.7%-75.5%	67.0%-71.7%	67.0 - 77.8%	54.3% - 65.5%
Dividend yield	0%	0%	0%	0%

Expected Term — The Company has opted to use the "simplified method" for estimating the expected term of options, whereby the expected term equals the arithmetic average of the vesting term and the original contractual term of the option (generally 10 years).

Expected Volatility — Due to the Company's limited operating history and a lack of company specific historical and implied volatility data, the Company has based its estimate of expected volatility on the historical volatility of a group of similar companies that are publicly traded. The historical volatility data was computed using the daily closing prices for the selected companies' shares during the equivalent period of the calculated expected term of the stock-based awards.

Risk-Free Interest Rate — The risk-free rate assumption is based on the U.S. Treasury instruments with maturities similar to the expected term of the Company's stock options.

Expected Dividend — The Company has not issued any dividends in its history and does not expect to issue dividends over the life of the options and therefore has estimated the dividend yield to be zero.

Fair value of Common Stock — The fair value of the shares of common stock underlying the stock-based awards has historically been determined by the board of directors, with input from management. Because there has been no public market for the Company's common stock, the board of directors has determined the fair value of the common stock on the grant-date of the stock-based award by considering a number of objective and subjective factors, including enterprise valuations of the Company's common stock performed by an unrelated third-party specialist, valuations of comparable companies, sales of the Company's convertible preferred stock to unrelated third parties, operating and financial performance, the lack of liquidity of the Company's capital stock, and general and industry-specific economic outlook. The board of directors intended all options granted to be exercisable at a price per share not less than the estimated per share fair value of common stock underlying those options on the date of grant.

As of December 31, 2018, 2017 and 2016, there was a total of $11.0 million and $1.9 million, $0.4 million, respectively, of unrecognized employee compensation costs related to non-vested stock option awards. During the years ended December 31, 2018, 2017 and 2016, the intrinsic value of shares exercised was $0.6 million, $2.5 million and $1.2 million, respectively, and the fair value of shares vested during the respective years was $3.0 million, $0.5 million and $0.1 million.

Non-employee stock-based compensation

As of December 31, 2018, 2017 and 2016, 14,918, 63,878 and 37,311, respectively, of vested stock options and 31,388, 77,466 and 47,971, respectively, of unvested stock options were held by non-employees. The Company remeasures the estimated fair value of the unvested portion of the award each period, until the award is fully vested. The Company believes that the fair value of the stock options is more reliably measurable than the fair value of services received. The fair value of options granted to non-employees was estimated using the Black-Scholes method. The amount of stock-based compensation expense related to non-employees recognized in the consolidated financial statements for the year ended December 31, 2018 was $0.3 million and for the years ended December 31, 2017 and 2016 was immaterial.

Restricted stock awards

In 2015, in conjunction with the incorporation of the Company, the Company issued a total of 2,777,776 shares of common stock at $0.0004 per share to its two founders, the Chief Executive Officer and the President, under restricted stock agreements. At the date of grant, the shares had an estimated fair value of $0.0004 per share. Under the terms of the restricted stock agreements, shares vest monthly over four years. Upon the termination of service of these individuals, unvested shares are subject to repurchase by the Company at the original issue price.

A summary of the Company's non-vested restricted stock for the periods presented is as follows:

	Number of Shares	Weighted Average Grant Date Fair Value	Remaining Contractual Term (Years)
Balance, December 31, 2015	2,372,684	$ 0.000396	3.4
Vested during the year	694,444	$ 0.000396	
Balance, December 31, 2016	1,678,240	$ 0.000396	2.4
Vested during the year	694,444	$ 0.000396	
Balance, December 31, 2017	983,796	$ 0.000396	1.4
Vested during the year	694,444	$ 0.000396	
Balance, December 31, 2018	289,352	$ 0.000396	0.4

Note 10. Net Loss per Share

The following table sets forth the computation of basic and diluted net loss per share (in thousands, except share and per share data):

	Year Ended December 31, 2018	Year Ended December 31, 2017	Year Ended December 31, 2016
Numerator:			
Net loss	$ (49,594)	$ (53,082)	$ (17,970)
Denominator:			
Weighted-average common shares outstanding	36,357,336	3,885,508	3,374,609
Less: weighted-average common shares subject to repurchase	(1,739,099)	(2,057,246)	(2,510,626)
Weighted-average common shares used to compute basic and diluted net loss per share	34,618,237	1,828,262	863,983
Net loss per share, basic and diluted	$ (1.43)	$ (29.03)	$ (20.80)

The following outstanding potentially dilutive securities were excluded from the computation of diluted net loss per share for the periods presented because including them would have been antidilutive:

	December 31, 2018	December 31, 2017	December 31, 2016
Convertible preferred stock	—	30,459,579	21,307,643
Common stock options issued and outstanding	1,458,079	544,116	129,918
Unvested restricted common stock	289,352	983,796	1,678,240
Unvested early exercised common stock options	927,123	812,769	525,797
Total	2,674,554	32,800,260	23,641,598

Note 11: Provision for Income Taxes

The provision for income taxes differs from the amount expected by applying the federal statutory rate to the loss before taxes as follows:

	Year Ended December 31, 2018	Year Ended December 31, 2017	Year Ended December 31, 2016
Federal statutory income tax rate	21.00%	34.00%	34.00%
Non-deductible expenses and other	(1.54)%	(1.23)%	(0.22)%
Change in valuation allowance	(19.46)%	(16.46)%	(33.78)%
Remeasurement of federal tax rate change	—	(16.32)%	—
Total	0.00%	0.00%	0.00%

As of December 31, 2018 and 2017, the components of the Company's deferred tax assets are as follows (in thousands):

	Year Ended December 31, 2018	Year Ended December 31, 2017
Deferred tax assets:		
Federal and state net operating loss carryforwards	$ 16,076	$ 11,101
Research and development credits carryforwards	5,087	2,706
Depreciation	3,942	3,489
Deferred Revenue	3,909	—
Other	1,724	1,292
Total deferred tax assets	30,738	18,588
Less valuation allowance	(30,738)	(18,588)
Net deferred tax assets	$ —	$ —

Deferred income taxes reflect the net tax effects of (a) temporary differences between the carrying amounts of assets and liabilities for financial reporting purposes and the amounts used for income tax purposes, and (b) operating losses and tax credit carryforwards.

The Company's accounting for deferred taxes involves the evaluation of a number of factors concerning the realizability of its net deferred tax assets. The Company primarily considered such factors as its history of operating losses, the nature of the Company's deferred tax assets, and the timing, likelihood and amount, if any, of future taxable income during the periods in which those temporary differences and carryforwards become deductible. At present, the Company does not believe that it is more likely than not that the deferred tax assets will be realized; accordingly, a full valuation allowance has been established and no deferred tax asset is shown in the accompanying consolidated balance sheets. The valuation allowance increased by approximately $12.2 million, 10.2 million and $7.6 million, respectively, for the years ended December 31, 2018, 2017 and 2016.

In December 2017, the 2017 Tax Cuts and Jobs Act (2017 Tax Act) was enacted and includes a broad range of provisions, many of which differ significantly from those contained in previous U.S. tax law. Changes in tax law are accounted for in the period of enactment. As such, the Company's consolidated financial statements as of December, 31, 2018 and 2017 reflect the impact of this 2017 Tax Act, which primarily consisted of measuring the Company's deferred tax assets and valuation allowance using the newly enacted U.S. corporate tax rate.

At December 31, 2018, the Company has total net operating loss carryforwards (NOLs) of $70.9 million for federal income tax purposes, of which approximately $47.4 million begin to expire in 2035 and approximately $23.6 million that have no expiration date and federal research tax credits of approximately $3.6 million that begin to expire in 2035. The Company also has state NOLs of approximately $15.4 million that begin to expire in 2035, and state research tax credits of approximately $3.1 million that have no expiration date. Use of the NOLs and credit carryforwards may be subject to a substantial annual limitation due to the ownership change provisions of U.S. tax law, as defined in Section 382 and 383 of the Internal Revenue Code of 1986, as amended, and similar state provisions. The annual limitation may result in the expiration of NOLs and credits before use. The Company determined that an ownership change occurred in 2015 in conjunction with its Series A Preferred Stock financing and in 2017 in conjunction with its Series C Preferred Stock financing but does not expect that these ownership changes will result in the expiration of any the NOLs prior to utilization.

The Company has not been audited by the Internal Revenue Service, any state or foreign tax authority. The Company is subject to taxation in the United States and also beginning in 2017, in Australia. Because of the net operating loss and research credit carryforwards, all of the Company's tax years, from 2015 to 2018, remain open to U.S. federal and California state tax examinations. In addition, the Company's tax years from 2017 to 2018 are open to examination in Australia. There were no interest or penalties accrued at December 31, 2018, 2017 and 2016.

Uncertain Tax Positions

The Company follows the provisions of FASB Accounting Standards Codification (ASC 740-10), *Accounting for Uncertainty in Income Taxes* . ASC 740-10 prescribes a comprehensive model for the recognition, measurement, presentation and disclosure in financial statements of uncertain tax positions that have been taken or expected to be taken on a tax return. No liability related to uncertain tax positions is recorded in the consolidated financial statements. The Company's reserve for unrecognized tax benefits is approximately $1.1 million and $0.6 million and $0.2 million at December 31, 2018, 2017 and 2016, respectively.

Due to the full valuation allowance at December 31, 2018, 2017 and 2016, current adjustments to the unrecognized tax benefit will have no impact on the Company's effective income tax rate; any adjustments made after the valuation allowance is released will have an impact on the tax rate.

A reconciliation of the beginning and ending amount of unrecognized tax benefits is as follows (in thousands):

	Year Ended December 31, 2018	Year Ended December 31, 2017	Year Ended December 31, 2016
Beginning balance	$ 622	$ 242	$ 19
Additions for tax positions taken in a prior year	8	29	—
Additions for tax positions taken in current year	454	351	223
Ending balance	$ 1,084	$ 622	$ 242

The Company does not anticipate material changes to its uncertain tax positions through the next 12 months.

Note 12: Commitments

Purchase Commitments

The Company has contractual arrangements with research and development organizations and suppliers; however, these contracts are generally cancelable on 30 days' notice and the obligations under these contracts are largely based on services performed.

Leases

The Company leases office space in Hayward, California under non-cancelable operating leases with expiration in 2025. Rent expense was $1.6 million, $0.9 million and $0.6 million for the years ended December 31, 2018, 2017 and 2016, respectively. Future minimum lease payments under non-cancelable operating leases as of December 31, 2018 are as follows (in thousands):

Year ending December 31:	Operating Leases
2019	$ 2,041
2020	2,105
2021	2,195
2022	2,265
2023	2,339
2024 and beyond	4,487
Total	$ 15,432

Total minimum lease payments have not been reduced by minimum sublease rent income of approximately $0.6 million under a future noncancelable sublease.

The Company has provided deposits for letters of credit totaling $0.2 million to secure its obligations under its lease, which have been classified as long-term assets on the Company's consolidated balance sheet as of December 31, 2018.

Indemnification

As permitted under Delaware law and in accordance with the Company's bylaws, the Company is required to indemnify its officers and directors for certain events or occurrences while the officer or director is or was serving in such capacity. The Company is also party to indemnification agreements with its directors and officers. The Company believes the fair value of the indemnification rights and agreements is minimal. Accordingly, the Company has not recorded any liabilities for these indemnification rights and agreements as of December 31, 2018, 2017 and 2016.

Note 13: Employee Benefit Plan

The Company sponsors a 401(k) defined contribution plan for its employees. This plan provides for tax-deferred salary deductions for all employees. Employee contributions are voluntary. Employees may contribute up to 100% of their annual compensation to this plan, as limited by an annual maximum amount as determined by the Internal Revenue Service. The Company may match employee contributions in amounts to be determined at the Company's sole discretion. The Company made no contributions to the plan for the years ended December 31, 2018, 2017 and 2016.

Note 14: Selected Unaudited Quarterly Financial Data

The following table summarizes the Company's unaudited quarterly financial data for the last two years (in thousands, except per share data):

	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
2018				
Total revenues	$ 1,250	$ 1,250	$ 4,291	$ 1,562
Total operating expenses	$ 14,581	$ 17,149	$ 16,436	$ 15,046
Net loss	$ (12,954)	$ (13,533)	$ (10,812)	$ (12,295)
Net loss per share — basic and diluted	$ (1.37)	$ (0.32)	$ (0.25)	$ (0.28)
Weighted average number of shares, basic and diluted	9,488,352	42,533,641	42,838,098	43,163,412
2017				
Total revenues	$ —	$ —	$ 163	$ 1,250
Total operating expenses	$ 7,300	$ 9,664	$ 23,297	$ 14,594
Net loss	$ (7,200)	$ (9,550)	$ (23,122)	$ (13,210)
Net loss per share — basic and diluted	$ (4.96)	$ (5.64)	$ (11.86)	$ (5.98)
Weighted average number of shares, basic and diluted	1,452,215	1,693,150	1,949,258	2,208,065

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

None

Item 9A. Controls and Procedures

We maintain disclosure controls and procedures that are designed to ensure that information required to be disclosed in our Securities Exchange Act of 1934 (Exchange Act) reports is recorded, processed, summarized, and reported within the time periods specified in the rules and forms of the Securities and Exchange Commission, and that such information is accumulated and communicated to management, including our Chief Executive Officer and Principal Financial & Accounting Officer, as appropriate, to allow timely decisions regarding required disclosure.

A control system, no matter how well conceived and operated, can provide only reasonable, not absolute, assurance that the objectives of the control system are met. Because of inherent limitations in all control systems, no evaluation of controls can provide absolute assurance that all control issues, if any, within an organization have been detected. Accordingly, our disclosure controls and procedures are designed to provide reasonable, not absolute, assurance that the objectives of our disclosure control system are met.

As of the end of the period covered by this report, we carried out an evaluation, under the supervision and with the participation of our management, including our Chief Executive Officer and Principal Financial & Accounting Officer, of the effectiveness of our disclosure controls and procedures pursuant to Exchange Act Rule 13a-15. Based upon, and as of the date of, this evaluation, our Chief Executive Officer and Principal Financial & Accounting Officer concluded that our disclosure controls and procedures were effective at the reasonable assurance level.

Exemption from management's report on internal control over financial reporting for the fiscal year ended December 31, 2016.

This Annual Report on Form 10-K does not include a report of management's assessment regarding internal control over financial reporting or an attestation report of our independent registered public accounting firm due to a transition period established by the rules of the SEC for newly public companies

Changes in Internal Control Over Financial Reporting

There were no changes in our internal control over financial reporting during the quarter ended December 31, 2018 that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

Item 9B. Other Information

On February 27, 2019, Steven Chan, our Vice President of Finance and principal financial and accounting officer, notified Arcus of his intent to leave Arcus on April 3, 2019 to pursue another opportunity. Arcus and Mr. Chan have entered into a separation and consulting agreement pursuant to which Mr. Chan will provide consulting services to Arcus until July 1, 2019, which separation and consulting agreement contains a non-disparagement obligation and standard release of claims.

Arcus expects an orderly transition from Mr. Chan to his successor, who has accepted our offer to serve as our Chief Operating and Financial Officer.

PART III

Item 10. Directors, Executive Officers and Corporate Governance

The information required by this Item will be set forth in our proxy statement to be filed with the Securities and Exchange Commission within 120 days after the end of our fiscal year ended December 31, 2018 (our "Proxy Statement") and is incorporated into this Annual Report on Form 10-K by reference, specifically:

- Information regarding our directors and any persons nominated to become a director, as well as with respect to some other required board matters, is set forth under Proposal 1 entitled "Election of Directors" and under "Corporate Governance."
- Information regarding our audit committee and our designated "audit committee financial expert" is set forth under the caption "Corporate Governance."
- Information regarding Section 16(a) beneficial ownership reporting compliance is set forth under the caption "Section 16(a) Beneficial Ownership Reporting Compliance."
- Information regarding procedures by which stockholders may recommend nominees to our board of directors is set forth under the caption "Nominating and Corporate Governance Committee" under "Corporate Governance."
- Information regarding our executive officers is set forth under "Executive Officers."

We have adopted a Code of Conduct and Ethics that applies to all directors, officers and employees of the Company, which is available on our website at www.arcusbio.com . If we make any substantive amendments to our Code of Conduct and Ethics or grant any waivers to our directors or executive officers, we will disclose it on our website or in a Current Report on Form 8-K.

Item 11. Executive Compensation

The information required by this Item will be set forth in our Proxy Statement under the captions "Executive Compensation," "Compensation of Directors" and "Compensation Committee Interlocks and Insider Participation" and is incorporated into this Annual Report on Form 10-K by reference.

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

The information required by this Item will be set forth in our Proxy Statement under the caption "Security Ownership of Certain Beneficial Owners and Management" and "Equity Compensation Plan Information" and is incorporated into this Annual Report on Form 10-K by reference.

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

The information required by this Item will be set forth in our Proxy Statement under the captions "Related Person Transactions" and "Corporate Governance" and is incorporated into this Annual Report on Form 10-K by reference.

Item 14. Principal Accounting Fees and Services

The information required by this Item will be set forth in our Proxy Statement under the Proposal with the caption "Ratification of Appointment of Independent Registered Public Accounting Firm" and is incorporated into this Annual Report on Form 10-K by reference.

PART IV

Item 15. Exhibits, Financial Statement Schedules

(a) The following documents are filed as part of this Annual Report on Form 10-K:

(1) Financial Statements

See Index to Consolidated Financial Statements at Item 8 herein.

(2) Financial Statement Schedules

All schedules are omitted because they are not applicable or the required information is shown in the financial statements or notes thereto.

(3) Exhibits.

See Exhibit Index following Item 16 below.

Item 16. Form 10-K Summary

None

Exhibit Index

Exhibit Number	Exhibit Description	Incorporated by Reference			
		Form	File No	Exhibit	Filing Date
3.1	Amended and Restated Certificate of Incorporation	10-Q	001-38419	3.1	May 9, 2018
3.2	Amended and Restated Bylaws	10-Q	001-38419	3.2	May 9, 2018
10.1 A	Form of Indemnification Agreement between the Registrant and each of its directors and executive officers.	S-1	333-223086	10.1	February 16, 2018
10.2 A	Arcus Biosciences, Inc. 2015 Stock Plan and forms of agreements thereunder.	S-1/A	333-223086	10.2	March 5, 2018
10.3 A	Arcus Biosciences, Inc. 2018 Equity Incentive Plan, including form agreements, to be in effect upon completion of the offering.	S-1/A	333-223086	10.3	March 5, 2018
10.4 A	Arcus Biosciences, Inc. 2018 Employee Stock Purchase Plan, to be in effect upon the completion of the offering.	S-1/A	001-38419	10.4	March 5, 2018
10.5 A	Amended and Restated Letter Agreement, dated February 14, 2018, between the Registrant and Terry Rosen, Ph.D.	S-1	333-223086	10.5	February 16, 2018
10.6 A	Amended and Restated Letter Agreement, dated February 14, 2018, between the Registrant and Juan Carlos Jaen, Ph.D.	S-1	333-223086	10.6	February 16, 2018
10.7 A	Amended and Restated Letter Agreement, dated February 14, 2018, between the Registrant and Jennifer Jarrett.	S-1	333-223086	10.7	February 16, 2018
10.8	Lease, dated September 30, 2015, between the Registrant and Hayward Point Eden I Limited Partnership, as amended on July 22, 2016 and October 12, 2017.	S-1	333-223086	10.8	February 16, 2018
10.9	Compensation Program for Non-Employee Directors.	S-1	333-223086	10.9	February 16, 2018
10.10 B	License Agreement, dated December 8, 2016, between the Registrant and Abmuno Therapeutics LLC.	S-1	333-223086	10.10	February 16, 2018
10.11 B	License Agreement, dated August 16, 2017, between the Registrant and WuXi Biologics (Cayman) Inc.	S-1	333-223086	10.11	February 16, 2018
10.12 B	Option and License Agreement, dated September 19, 2017, between the Registrant and Taiho Pharmaceutical Co., Ltd.	S-1	333-223086	10.12	February 16, 2018
10.13 A	Arcus Biosciences, Inc. Management Cash Incentive Plan.	S-1	333-223086	10.13	February 16, 2018
10.14 A	Form of Severance and Change in Control Agreement (for use before September 24, 2018).	S-1	333-223086	10.14	February 16, 2018
10.15B	Amendment No. 1 to Option and License Agreement, dated September 19, 2017, between Arcus Biosciences, Inc. and Taiho Pharmaceutical Co, Ltd.	10-Q	001-38419	10.1	November 8, 2018

10.16 A	Form of Severance and Change in Control Agreement (for use from September 24, 2018)	10-Q	001-38419	10.2	November 8, 2018
10.17* A	Separation and Consulting Agreement by and between the Company and Jennifer Jarrett dated January 3, 2019				
10.18* A	Separation and Consulting Agreement by and between the Company and Steven Chan dated March 1, 2019				
23.1*	Consent of independent registered public accounting firm				
24.1*	Power of Attorney (included on signature page to this Annual Report)				
31.1*	Certification of Principal Executive Officer 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.				
31.2*	Certification of Principal Financial Officer 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.				
32.1†	Certification of 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 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				
101.PRE	XBRL Taxonomy Extension Presentation Linkbase Document				

* Filed herewith.

A Indicates management contract or compensatory plan or arrangement.

B The Company has been granted confidential treatment for certain portions of this exhibit. The omitted portions have been filed separately with the Securities and Exchange Commission.

† This certification is deemed not filed for purposes of section 18 of the Exchange Act, or otherwise subject to the liability of that section, nor shall it be deemed incorporated by reference into any filing under the Securities Act or the Exchange Act.

SIGNAT URES

Pursuant to the requirements of Section 13 or 15(d) 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 **.**

ARCUS BIOSCIENCES, INC.

Date: March 5, 2019

By: /s/ Terry Rosen

Terry Rosen, Ph.D.
Chief Executive Officer
(Principal Executive Officer and Duly Authorized Officer)

POWER OF ATTORNEY

KNOW ALL PERSONS BY THESE PRESENTS that each person whose signature appears below constitutes and appoints Terry Rosen, Ph.D. and Juan Carlos Jaen, Ph.D., and each of them, his or her true and lawful attorneys-in-fact and agents, each 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 any and all amendments to this Annual Report on Form 10-K and to file the same, with exhibits thereto and other documents in connection therewith, with the Securities and Exchange Commission, granting unto said attorneys-in fact and agents, and each of them, full power and authority to do and perform each and every act and thing requisite and necessary to be done, as fully to all intents and purposes as he or she might or could do in person, hereby ratifying and confirming all that each of said attorneys-in-fact and agents 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, as amended, this Annual Report on Form 10-K has been signed below by the following persons on behalf of the Registrant in the capacities and on the dates indicated.

Name	Title	Date
/s/ Terry Rosen **Terry Rosen, Ph.D.**	Chief Executive Officer and Director (Principal Executive Officer)	March 5, 2019
/s/ Juan Carlos Jaen **Juan Carlos Jaen, Ph.D.**	President and Director	March 5, 2019
/s/ Steven Chan **Steven Chan**	Principal Financial and Accounting Officer	March 5, 2019
/s/ David William Beier **David William Beier**	Director	March 5, 2019
/s/ Kathryn Falberg **Kathryn Falberg**	Director	March 5, 2019
/s/ Kristen Hege **Kristen Hege, M.D.**	Director	March 5, 2019
/s/ Jennifer Jarrett **Jennifer Jarrett**	Director	March 5, 2019
/s/ Yasunori Kaneko **Yasunori Kaneko, M.D.**	Director	March 5, 2019

Exhibit 10.17

January 3, 2019

Jennifer Jarrett

Dear Jen:

This letter (the " ***Agreement*** ") confirms the agreement between you and Arcus Biosciences, Inc. (the " ***Company*** ") regarding your employment transition.

1. Separation Date . As we have agreed, your last day of work with the Company and your employment termination date will be January 11, 2019 (the " ***Separation Date*** ").

2. Accrued Salary and Paid Time Off . On the Separation Date, the Company will pay you all accrued salary, and all accrued and unused vacation earned through the Separation Date, subject to standard payroll deductions and withholdings. You are entitled to these payments by law.

3. Consulting Services . You and the Company have agreed that the Company will retain you as a consultant under the terms specified below. The consulting relationship commences on the Separation Date and continues through January 11, 2020, unless terminated earlier by the Company as set forth in this Section 4 below, which relationship may be renewed on an annual basis or otherwise extended as mutually agreed to between the parties (the " ***Consulting Period*** "). Your agreement to provide consulting services is in consideration of the benefits to be provided to you under this Agreement. There is no separate compensation specifically attributable to your consulting services.

(a) Consulting Services. During the Consulting Period, you will use your best efforts, as may be requested by the Company, to facilitate the transition of your responsibilities to one or more employees of the Company and provide advisory services, including but not limited to areas of business development, investor relations and capital markets (the " ***Consulting Services*** "). You will report to the Company's Chief Executive Officer. You agree to exercise the highest degree of professionalism and utilize your expertise and creative talents in performing these services. During the Consulting Period, you shall abide by the Company's applicable policies and procedures.

(b) 2018 Bonus . In consideration of your consulting services, the Company will pay you your annual bonus for 2018 in the amount of $200,000, subject to standard payroll deductions and withholdings (the " ***Bonus Amount*** "). The Bonus Amount will be paid to you on your Separation Date.

(c) Stock Options . Since you will provide Consulting Services to the Company immediately after the Separation Date, your termination of employment will not constitute a termination of service for purposes of the Company's 2015 Stock Plan and 2018 Equity Incentive Plan (collectively, the " ***Plans*** "). Thus, vesting of your outstanding stock options (the " ***Stock Options*** ") will not cease as of the Separation Date and will continue for the duration

of the Consulting Period. Your Stock Options shall continue to be governed by the Plan s and all applicable grant notices and agreements.

(d) Independent Contractor Relationship . During the Consulting Period, your relationship with the Company will be that of an independent contractor, and nothing in this Agreement is intended to, or should be construed to, create a partnership, agency, joint venture or employment relationship after the Separation Date. Except as expressly provided in this Agreement, you will not be entitled to, and will not receive, any benefits which the Company may make available to its employees, including but not limited to, group health or life insurance, profit-sharing or retirement benefits.

(e) Limitations on Authority. During the Consulting Period, you will have no responsibilities or authority as a consultant to the Company other than as provided above. You will have no authority to bind the Company to any contractual obligations, whether written, oral or implied, except with the prior written authorization of an officer of the Company. You agree not to represent or purport to represent the Company in any manner whatsoever to any third party unless authorized in advance by the Company, in writing, to do so.

(f) Termination of Consulting Period. Without waiving any other rights or remedies, the Company may immediately terminate the Consulting Period at any time in the event of any breach of your obligations hereunder.

4. Other Compensation or Benefits. You acknowledge that, except as expressly provided in this Agreement, you have not earned and will not receive from the Company any additional compensation (including base salary, bonus, incentive compensation, or equity), severance, or benefits on or after the Separation Date, with the exception of any vested right you may have under the express terms of a written ERISA-qualified benefit plan (e.g., 401(k) account) or any vested options.

5. Expense Reimbursements. You agree that, within ten (10) days of the Separation Date, you will submit your final documented expense reimbursement statement reflecting all business expenses you incurred through the Separation Date, if any, for which you seek reimbursement. The Company will reimburse you for these expenses pursuant to its regular business practice.

6. Return of Company Property . Within thirty (30) days of the end of the Consulting Period, you agree to return to the Company all Company documents (and all copies thereof) and other Company property which you have in your possession or control, including, but not limited to, Company files, notes, drawings, records, plans, forecasts, reports, studies, analyses, proposals, agreements, financial information, research and development information, sales and marketing information, customer lists, prospect information, pipeline reports, sales reports, operational and personnel information, specifications, code, software, databases, computer-recorded information, tangible property and equipment (including, but not limited to, computers, facsimile machines, mobile telephones, servers), credit cards, entry cards, identification badges and keys; and any materials of any kind which contain or embody any proprietary or confidential information of the Company (and all reproductions thereof in whole or in part). You agree that you will make a diligent search to locate any such documents,

property and information by the close of business on the Separation Date. If you have used any personally owned computer, server, or e-mail system to receive, store, review, prepare or transmit any Company confidential or proprietary data, materials or information, within the same thirty (30) day period specified above , you shall provide the Company with a computer-useable copy of such information and then permanently delete and expunge such Company confidential or proprietary information from those systems; and you agree to provide the Company access to your system as requested to verify that the necessary copying and/or deletion is done.

7. Proprietary Information Obligations . You acknowledge and reaffirm your continuing obligations under your Proprietary Information and Inventions Agreement, a copy of which is attached hereto as Exhibit A.

8. Confidentiality . The provisions of this Agreement will be held in strictest confidence by you and will not be publicized or disclosed by you in any manner whatsoever; *provided, however,* that: (a) you may disclose this Agreement in confidence to your immediate family and to your attorneys, accountants, tax preparers and financial advisors; and (b) you may disclose this Agreement insofar as such disclosure may be necessary to enforce its terms or as otherwise required by law. In particular, and without limitation, you agree not to disclose the terms of this Agreement to any current or former Company employee. The Company may disclose this Agreement as required by corporate disclosure requirements.

9. Nondisparagement. You agree not to disparage the Company, its officers, directors, employees, shareholders, and agents, in any manner likely to be harmful to its or their business, business reputation, or personal reputation; provided that you will respond accurately and fully to any question, inquiry or request for information when required by legal process.

10. No Admissions. You understand and agree that the promises and payments in consideration of this Agreement shall not be construed to be an admission of any liability or obligation by the Company to you or to any other person, and that the Company makes no such admission.

11. Release of Claims . In consideration for the bonus payment and the Company's agreement to enter into the consulting relationship with you as set forth above, which consideration you would not otherwise be entitled, you hereby generally and completely release the Company and its directors, officers, employees, shareholders, partners, agents, attorneys, predecessors, successors, parent and subsidiary entities, insurers, affiliates, and assigns from any and all claims, liabilities and obligations, both known and unknown, that arise out of or are in any way related to events, acts, conduct, or omissions occurring at any time prior to and including the date you sign this Agreement. This general release includes, but is not limited to: (a) all claims arising out of or in any way related to your employment with the Company or the termination of that employment; (b) all claims related to your compensation or benefits from the Company, including salary, bonuses, commissions, vacation pay, expense reimbursements, severance pay, fringe benefits, stock, stock options, or any other ownership interests in the Company; (c) all claims for breach of contract, wrongful termination, and breach of the implied covenant of good faith and fair dealing; (d) all tort claims, including claims for fraud, defamation, emotional distress, and discharge in violation of public policy; and (e) all federal, state, and local statutory claims, including claims for discrimination, harassment, retaliation,

attorneys' fees, or other claims arising under the federal Civil Rights Act of 1964 (as amended), the federal Americans with Disabilities Act of 1990, the California Labor Code (as amended), the California Family Rights Act, the Age Discrimination in Employment Act ("ADEA") and the California Fair Employment and Housing Act (as amended) . Notwithstanding the foregoing, you are not releasing the Company hereby from any obligation to indemnify you pursuant to the Articles and Bylaws of the Company, any valid fully executed indemnification agreement with the Company, applicable law, or applicable directors and officers liability insurance. Also, excluded from this Agreement are any claims that cannot be waived by law. You are waiving, however, your right to any monetary recovery should any governmental agency or entity, such as the Equal Employment Opportunity Commission or the Department of Labor, pursue any claims on your behalf. You represent that you have no lawsuits, claims or actions pending in your name, or on behalf of any other person or entity, against the Company or any other person or entity subject to the release granted in this paragraph.

12. ADEA Release. You acknowledge that you are knowingly and voluntarily waiving and releasing any rights you have under the ADEA, and that the consideration given for the waiver and releases you have given in this Agreement is in addition to anything of value to which you were already entitled. You further acknowledge that you have been advised, as required by the ADEA, that: (a) your waiver and release does not apply to any rights or claims that arise after the date you sign this Agreement; (b) you should consult with an attorney prior to signing this Agreement (although you may choose voluntarily not to do so); (c) you have twenty-one (21) days to consider this Agreement (although you may choose voluntarily to sign it sooner); (d) you have seven (7) days following the date you sign this Agreement to revoke this Agreement (in a written revocation sent to me); and (e) this Agreement will not be effective until the date upon which the revocation period has expired, which will be the eighth day after you sign this Agreement provided that you do not revoke it (the " ***Effective Date*** ").

13. Section 1542 Waiver. In giving the release herein, which includes claims which may be unknown to you at present, you acknowledge that you have read and understand Section 1542 of the California Civil Code, which reads as follows:

> **"A general release does not extend to claims which the creditor does not know or suspect to exist in his or her favor at the time of executing the release, which if known by him or her must have materially affected his or her settlement with the debtor."**

You hereby expressly waive and relinquish all rights and benefits under that section and any law of any other jurisdiction of similar effect with respect to your release of claims herein, including but not limited to your release of unknown claims.

14. Representations. You hereby represent that you have been paid all compensation owed and for all hours worked, have received all the leave and leave benefits and protections for which you are eligible pursuant to the Family and Medical Leave Act, the California Family Rights Act, or otherwise, and have not suffered any on-the-job injury for which you have not already filed a workers' compensation claim.

15. Miscellaneous. This Agreement, including Exhibit A, constitutes the complete, final and exclusive embodiment of the entire agreement between you and the Company with regard to its subject matter. It is entered into without reliance on any promise or representation, written or oral, other than those expressly contained herein, and it supersedes any other such promises, warranties or representations. This Agreement may not be modified or amended except in a writing signed by both you and a duly authorized officer of the Company. This Agreement will bind the heirs, personal representatives, successors and assigns of both you and the Company, and inure to the benefit of both you and the Company, their heirs, successors and assigns. If any provision of this Agreement is determined to be invalid or unenforceable, in whole or in part, this determination will not affect any other provision of this Agreement and the provision in question will be modified so as to be rendered enforceable. This Agreement will be deemed to have been entered into and will be construed and enforced in accordance with the laws of the State of California without regard to conflict of laws principles. Any ambiguity in this Agreement shall not be construed against either party as the drafter. Any waiver of a breach of this Agreement shall be in writing and shall not be deemed to be a waiver of any successive breach. This Agreement may be executed in counterparts and facsimile signatures will suffice as original signatures.

If this Agreement is acceptable to you, please sign and date below and return the original to me. You have twenty-one (21) calendar days to decide whether you would like to accept this Agreement, and the Company's offer contained herein will automatically expire if you do not sign and return it within this timeframe.

We wish you the best in your future endeavors.

Sincerely,

By: /s/ Terry Rosen
Terry Rosen, CEO

I HAVE READ, UNDERSTAND AND AGREE FULLY TO THE FOREGOING AGREEMENT:

/s/ Jennifer Jarrett
Jennifer Jarrett

1/3/2019
Date

EXHIBIT A

PROPRIETARY INFORMATION AND INVENTIONS AGREEMENT

PROPRIETARY INFORMATION AND INVENTIONS AGREEMENT

The following confirms and memorializes an agreement that Arcus Biosciences, Inc., a Delaware corporation (the "Company") and I (Jennifer Jarrett) have had since the commencement of my employment (which term, for purposes of this agreement, shall be deemed to include any relationship of service to the Company that I may have had prior to actually becoming an employee) with the Company in any capacity and that is and has been a material part of the consideration for my employment by Company:

1. I have not entered into, and I agree I will not enter into, any agreement either written or oral in conflict with this Agreement or my employment with Company. I will not violate any agreement with or rights of any third party or, except as expressly authorized by Company in writing hereafter, use or disclose my own or any third party's confidential information or intellectual property when acting within the scope of my employment or otherwise on behalf of Company. Further, I have not retained anything containing any confidential information of a prior employer or other third party, whether or not created by me.

2. Company shall own all right, title and interest (including patent rights, copyrights, trade secret rights, mask work rights, sui generis database rights and all other intellectual property rights of any sort throughout the world) relating to any and all inventions (whether or not patentable), works of authorship, mask works, designs, know-how, ideas and information made or conceived or reduced to practice, in whole or in part, by me during the term of my employment with Company to and only to the fullest extent allowed by California Labor Code Section 2870 (which is attached as Appendix A) (collectively "Inventions") and I will promptly disclose all Inventions to Company. Without disclosing any third party confidential information, I will also disclose anything I believe is excluded by Section 2870 so that the Company can make an independent assessment. I hereby make all assignments necessary to accomplish the foregoing. I shall further assist Company, at Company's expense, to further evidence, record and perfect such assignments, and to perfect, obtain, maintain, enforce, and defend any rights specified to be so owned or assigned. I hereby irrevocably designate and appoint Company as my agent and attorney-in-fact, coupled with an interest and with full power of substitution, to act for and in my behalf to execute and file any document and to do all other lawfully permitted acts to further the purposes of the foregoing with the same legal force and effect as if executed by me. Without limiting Section 1 or Company's other rights and remedies, if, when acting within the scope of my employment or otherwise on behalf of Company, I use or disclose my own or any third party's confidential information or intellectual property (or if any Invention cannot be fully made, used, reproduced, distributed and otherwise exploited without using or violating the foregoing), Company will have and I hereby grant Company a perpetual, irrevocable, worldwide royalty-free, non-exclusive, sublicensable right and license to exploit and exercise all such confidential information and intellectual property rights.

3. To the extent allowed by law, paragraph 2 includes all rights of paternity, integrity, disclosure and withdrawal and any other rights that may be known as or referred to as "moral rights," "artist's rights," "droit moral," or the like (collectively "Moral Rights"). To the extent I retain any such Moral Rights under applicable law, I hereby ratify and consent to any action that may be taken with respect to such Moral Rights by or authorized by Company and

agree not to assert any Moral Rights with respect thereto. I will confirm any such ratifications, consents and agreements from time to time as requested by Company.

4. I agree that all Inventions and all other business, technical and financial information (including, without limitation, the identity of and information relating to customers or employees) I develop, learn or obtain during the term of my employment that relate to Company or the business or demonstrably anticipated business of Company or that are received by or for Company in confidence, constitute "Proprietary Information." I will hold in confidence and not disclose or, except within the scope of my employment, use any Proprietary Information. However, I shall not be obligated under this paragraph with respect to information I can document is or becomes readily publicly available without restriction through no fault of mine. Upon termination of my employment, I will promptly return to Company all items containing or embodying Proprietary Information (including all copies), except that I may keep my personal copies of (i) my compensation records, (ii) materials distributed to shareholders generally and (iii) this Agreement. I also recognize and agree that I have no expectation of privacy with respect to Company's telecommunications, networking or information processing systems (including, without limitation, stored computer files, email messages and voice messages) and that my activity and any files or messages on or using any of those systems may be monitored at any time without notice.

5. Until one year after the term of my employment, I will not encourage or solicit any employee or consultant of Company to leave Company for any reason (except for the bona fide firing of Company personnel within the scope of my employment).

6. I agree that during the term of my employment with Company (whether or not during business hours), I will not engage in any activity that is in any way competitive with the business or demonstrably anticipated business of Company, and I will not assist any other person or organization in competing or in preparing to compete with any business or demonstrably anticipated business of Company.

7. I agree that this Agreement is not an employment contract for any particular term and that I have the right to resign and Company has the right to terminate my employment at will, at any time, for any or no reason, with or without cause. In addition, this Agreement does not purport to set forth all of the terms and conditions of my employment, and, as an employee of Company, I have obligations to Company which are not set forth in this Agreement. However, the terms of this Agreement govern over any inconsistent terms and can only be changed by a subsequent written agreement signed by the President of Company.

8. I agree that my obligations under paragraphs 2, 3, 4 and 5 of this Agreement shall continue in effect after termination of my employment, regardless of the reason or reasons for termination, and whether such termination is voluntary or involuntary on my part, and that Company is entitled to communicate my obligations under this Agreement to any future employer or potential employer of mine. My obligations under paragraphs 2, 3 and 4 also shall be binding upon my heirs, executors, assigns, and administrators and shall inure to the benefit of Company, its subsidiaries, successors and assigns.

9. Any dispute in the meaning, effect or validity of this Agreement shall be resolved in accordance with the laws of the State of California without regard to the conflict of laws provisions thereof. I further agree that if one or more provisions of this Agreement are held to be illegal or unenforceable under applicable California law, such illegal or unenforceable portion(s) shall be limited or excluded from this Agreement to the minimum extent required so that this Agreement shall otherwise remain in full force and effect and enforceable in accordance with its terms. This Agreement is fully assignable and transferable by Company, but any purported assignment or transfer by me is void. I also understand that any breach of this Agreement will cause irreparable harm to Company for which damages would not be a adequate remedy, and, therefore, Company will be entitled to injunctive relief with respect thereto in addition to any other remedies and without any requirement to post bond.

NOTICE: This agreement does not affect any immunity under 18 USC Sections 1833(b) (1) or (2), which read as follows (note that for purposes of this statute only, individuals performing work as contractors or consultants are considered to be employees): (1) An individual shall not be held criminally or civilly liable under any Federal or State trade secret law for the disclosure of a trade secret that (A) is made (i) in confidence to a Federal, State, or local government official, either directly or indirectly, or to an attorney; and (ii) solely for the purpose of reporting or investigating a suspected violation of law; or (B) is made in a complaint or other document filed in a lawsuit or other proceeding, if such filing is made under seal. (2) An individual who files a lawsuit for retaliation by an employer for reporting a suspected violation of law may disclose the trade secret to the attorney of the individual and use the trade secret information in the court proceeding, if the individual (A) files any document containing the trade secret under seal; and (B) does not disclose the trade secret, except pursuant to court order.

I HAVE READ THIS AGREEMENT CAREFULLY AND I UNDERSTAND AND ACCEPT THE OBLIGATIONS WHICH IT IMPOSES UPON ME WITHOUT RESERVATION. NO PROMISES OR REPRESENTATIONS HAVE BEEN MADE TO ME TO INDUCE ME TO SIGN THIS AGREEMENT. I SIGN THIS AGREEMENT VOLUNTARILY AND FREELY, IN DUPLICATE, WITH THE UNDERSTANDING THAT THE COMPANY WILL RETAIN ONE COUNTERPART AND THE OTHER COUNTERPART WILL BE RETAINED BY ME.

March 3, 2017

Employee

/s/ Jennifer Jarrett
Signature

Jennifer Jarrett
Name (Printed)

Accepted and Agreed to:

ARCUS BIOSCIENCES, INC.

By: /s/ Juan C. Jaen
Juan C. Jaen, President

APPENDIX A

California Labor Code Section 2870. **Application of provision providing that employee shall assign or offer to assign rights in invention to employer.**

(a) Any provision in an employment agreement which provides that an employee shall assign, or offer to assign, any of his or her rights in an invention to his or her employer shall not apply to an invention that the employee developed entirely on his or her own time without using the employer's equipment, supplies, facilities, or trade secret information except for those inventions that either:

(1) Relate at the time of conception or reduction to practice of the invention to the employer's business, or actual or demonstrably anticipated research or development of the employer; or

(2) Result from any work performed by the employee for his employer.

(b) To the extent a provision in an employment agreement purports to require an employee to assign an invention otherwise excluded from being required to be assigned under subdivision (a), the provision is against the public policy of this state and is unenforceable.

March 1, 2019

Steven Chan

Dear Steve:

This letter (the " ***Agreement*** ") confirms the agreement between you and Arcus Biosciences, Inc. (the " ***Company*** ") regarding your employment transition.

1. Separation Date . As we have agreed, your last day of work with the Company and your employment termination date will be April 3, 2019 (the " ***Separation Date*** ").

2. Accrued Salary and Paid Time Off . On the Separation Date, the Company will pay you all accrued salary, and all accrued and unused vacation earned through the Separation Date, subject to standard payroll deductions and withholdings. You are entitled to these payments by law.

3. Consulting Services . You and the Company have agreed that the Company will retain you as a consultant under the terms specified below. The consulting relationship commences on the Separation Date and continues through July 1, 2019, unless terminated earlier by the Company as set forth in this Section 3 below or otherwise extended as mutually agreed to between the parties (the " ***Consulting Period*** "). Your agreement to provide consulting services is in consideration of the benefits to be provided to you under this Agreement. There is no separate compensation specifically attributable to your consulting services.

(a) Consulting Services. During the Consulting Period, you will use your best efforts, as may be requested by the Company, to facilitate the transition of your responsibilities to one or more employees of the Company and provide transition services, including but not limited to areas of relating to audit and accounting matters, financial planning and analysis, financial models and treasury (the " ***Consulting Services*** "). You will report to the Company's Chief Executive Officer. You agree to exercise the highest degree of professionalism and utilize your expertise and creative talents in performing these services. During the Consulting Period, you shall abide by the Company's applicable policies and procedures.

(b) Stock Options . Since you will provide Consulting Services to the Company immediately after the Separation Date, your termination of employment will not constitute a termination of service for purposes of the Company's 2015 Stock Plan and 2018 Equity Incentive Plan (collectively, the " ***Plans*** "). Thus, vesting of your outstanding stock options (the " ***Stock Options*** ") will not cease as of the Separation Date and will continue for the duration of the Consulting Period. Your Stock Options shall continue to be governed by the Plans and all applicable grant notices and agreements.

(d) Independent Contractor Relationship . During the Consulting Period, your relationship with the Company will be that of an independent contractor, and nothing in this Agreement is intended to, or should be construed to, create a partnership, agency, joint venture or employment relationship after the Separation Date. Except as expressly provided in this Agreement, you will not be entitled to, and will not receive, any benefits which the Company may make available to its employees, including but not limited to, group health or life insurance, profit-sharing or retirement benefits.

(e) Limitations on Authority. During the Consulting Period, you will have no responsibilities or authority as a consultant to the Company other than as provided above. You will have no authority to bind the Company to any contractual obligations, whether written, oral or implied, except with the prior written authorization of an officer of the Company. You agree not to represent or purport to represent the Company in any manner whatsoever to any third party unless authorized in advance by the Company, in writing, to do so.

(f) Termination of Consulting Period. Without waiving any other rights or remedies, the Company may immediately terminate the Consulting Period at any time in the event of any breach of your obligations hereunder.

4. Other Compensation or Benefits. You acknowledge that, except as expressly provided in this Agreement, you have not earned and will not receive from the Company any additional compensation (including base salary, bonus, incentive compensation, or equity), severance, or benefits on or after the Separation Date, with the exception of any vested right you may have under the express terms of a written ERISA-qualified benefit plan (e.g., 401(k) account) or any vested options.

5. Expense Reimbursements. You agree that, within ten (10) days of the Separation Date, you will submit your final documented expense reimbursement statement reflecting all business expenses you incurred through the Separation Date, if any, for which you seek reimbursement. The Company will reimburse you for these expenses pursuant to its regular business practice.

6. Return of Company Property . Within thirty (30) days of the Separation Date, you agree to return to the Company all Company documents (and all copies thereof) and other Company property which you have in your possession or control, including, but not limited to, Company files, notes, drawings, records, plans, forecasts, reports, studies, analyses, proposals, agreements, financial information, research and development information, sales and marketing information, customer lists, prospect information, pipeline reports, sales reports, operational and personnel information, specifications, code, software, databases, computer-recorded information, tangible property and equipment (including, but not limited to, computers, facsimile machines, mobile telephones, servers), credit cards, entry cards, identification badges and keys; and any materials of any kind which contain or embody any proprietary or confidential information of the Company (and all reproductions thereof in whole or in part). You agree that you will make a diligent search to locate any such documents, property and information by the close of business on the Separation Date. If you have used any personally owned computer, server, or e-mail system to receive, store, review, prepare or transmit any Company confidential or proprietary data, materials or information, within the same thirty (30) day period specified above, you shall provide the Company with a computer-useable copy of such information and then permanently delete and expunge such Company confidential or proprietary information from those systems; and you agree to provide the Company access to your system as requested to verify that the necessary copying and/or deletion is done.

7. Proprietary Information Obligations . You acknowledge and reaffirm your continuing obligations under your Proprietary Information and Inventions Agreement, a copy of which is attached hereto as Exhibit A.

8. Confidentiality . The provisions of this Agreement will be held in strictest confidence by you and will not be publicized or disclosed by you in any manner whatsoever; *provided, however,* that: (a) you may disclose this Agreement in confidence to your immediate family and to your attorneys, accountants, tax preparers and financial advisors; and (b) you may disclose this Agreement insofar as such disclosure may be necessary to enforce its terms or as otherwise required by law. In particular, and without limitation, you agree not to disclose the terms of this Agreement to any current or former Company employee. The Company may disclose this Agreement as required by corporate disclosure requirements.

9. Nondisparagement. You agree not to disparage the Company, its officers, directors, employees, shareholders, and agents, in any manner likely to be harmful to its or their business, business reputation, or personal reputation; provided that you will respond accurately and fully to any question, inquiry or request for information when required by legal process.

10. No Admissions. You understand and agree that the promises and payments in consideration of this Agreement shall not be construed to be an admission of any liability or obligation by the Company to you or to any other person, and that the Company makes no such admission.

11. Release of Claims . In consideration for your continued vesting of your Stock Options, which consideration you would not otherwise be entitled, you hereby generally and completely release the Company and its directors, officers, employees, shareholders, partners, agents, attorneys, predecessors, successors, parent and subsidiary entities, insurers, affiliates, and assigns from any and all claims, liabilities and obligations, both known and unknown, that arise out of or are in any way related to events, acts, conduct, or omissions occurring at any time prior to and including the date you sign this Agreement. This general release includes, but is not limited to: (a) all claims arising out of or in any way related to your employment with the Company or the termination of that employment; (b) all claims related to your compensation or benefits from the Company, including salary, bonuses, commissions, vacation pay, expense reimbursements, severance pay, fringe benefits, stock, stock options, or any other ownership interests in the Company; (c) all claims for breach of contract, wrongful termination, and breach of the implied covenant of good faith and fair dealing; (d) all tort claims, including claims for fraud, defamation, emotional distress, and discharge in violation of public policy; and (e) all federal, state, and local statutory claims, including claims for discrimination, harassment, retaliation, attorneys' fees, or other claims arising under the federal Civil Rights Act of 1964 (as amended), the federal Americans with Disabilities Act of 1990, the California Labor Code (as amended), the California Family Rights Act, the Age Discrimination in Employment Act ("ADEA") and the California Fair Employment and Housing Act (as amended). Notwithstanding the foregoing, you are not releasing the Company hereby from any obligation to indemnify you pursuant to the Articles and Bylaws of the Company, any valid fully executed indemnification agreement with the Company, applicable law, or applicable directors and officers liability insurance. Also, excluded from this Agreement are any claims that cannot be waived by law. You are waiving, however, your right to any monetary recovery should any governmental agency or entity, such as the Equal Employment Opportunity Commission or the Department of Labor, pursue any claims on your behalf. You represent that you have no lawsuits, claims or actions pending in your name, or on behalf of any other person or entity, against the Company or any other person or entity subject to the release granted in this paragraph.

12. ADEA Release. You acknowledge that you are knowingly and voluntarily waiving and releasing any rights you have under the ADEA, and that the consideration given for the waiver and releases you have given in this Agreement is in addition to anything of value to which you were already entitled. You further acknowledge that you have been advised, as required by the ADEA, that: (a) your waiver and release does not apply to any rights or claims that arise after the date you sign this Agreement; (b) you should consult with an attorney prior to signing this Agreement (although you may choose voluntarily not to do so); (c) you have twenty-one (21) days to consider this Agreement (although you may choose voluntarily to sign it sooner); (d) you have seven (7) days following the date you sign this Agreement to revoke this Agreement (in a written revocation sent to me); and (e) this Agreement will not be effective until the date upon which the revocation period has expired, which will be the eighth day after you sign this Agreement provided that you do not revoke it (the " ***Effective Date*** ").

13. Section 1542 Waiver. In giving the release herein, which includes claims which may be unknown to you at present, you acknowledge that you have read and understand Section 1542 of the California Civil Code, which reads as follows:

> **"A general release does not extend to claims which the creditor does not know or suspect to exist in his or her favor at the time of executing the release, which if known by him or her must have materially affected his or her settlement with the debtor."**

You hereby expressly waive and relinquish all rights and benefits under that section and any law of any other jurisdiction of similar effect with respect to your release of claims herein, including but not limited to your release of unknown claims.

14. Representations. You hereby represent that you have been paid all compensation owed and for all hours worked, have received all the leave and leave benefits and protections for which you are eligible pursuant to the Family and Medical Leave Act, the California Family Rights Act, or otherwise, and have not suffered any on-the-job injury for which you have not already filed a workers' compensation claim.

15. Miscellaneous. This Agreement, including Exhibit A, constitutes the complete, final and exclusive embodiment of the entire agreement between you and the Company with regard to its subject matter. It is entered into without reliance on any promise or representation, written or oral, other than those expressly contained herein, and it supersedes any other such promises, warranties or representations. This Agreement may not be modified or amended except in a writing signed by both you and a duly authorized officer of the Company. This Agreement will bind the heirs, personal representatives, successors and assigns of both you and the Company, and inure to the benefit of both you and the Company, their heirs, successors and assigns. If any provision of this Agreement is determined to be invalid or unenforceable, in whole or in part, this determination will not affect any other provision of this Agreement and the provision in question will be modified so as to be rendered enforceable. This Agreement will be deemed to have been entered into and will be construed and enforced in accordance with the laws of the State of California without regard to conflict of laws principles. Any ambiguity in this Agreement shall not be construed against either party as the drafter. Any waiver of a breach of this Agreement shall be in writing and shall not be deemed to be a waiver of any successive breach. This Agreement may be executed in counterparts and facsimile signatures will suffice as original signatures.

If this Agreement is acceptable to you, please sign and date below and return the original to me. You have twenty-one (21) calendar days to decide whether you would like to accept this Agreement, and the Company's offer contained herein will automatically expire if you do not sign and return it within this timeframe.

We wish you the best in your future endeavors.

Sincerely,

By: /s/ Terry Rosen
Terry Rosen, CEO

I HAVE READ, UNDERSTAND AND AGREE FULLY TO THE FOREGOING AGREEMENT:

/s/ Steven Chan
Steven Chan

March 4, 2019
Date

EXHIBIT A

PROPRIETARY INFORMATION AND INVENTIONS AGREEMENT

PROPRIETARY INFORMATION AND INVENTIONS AGREEMENT

The following confirms and memorializes an agreement that Arcus Biosciences, Inc., a Delaware corporation (the "Company") and I (Steven Chan) have had since the commencement of my employment (which term, for purposes of this agreement, shall be deemed to include any relationship of service to the Company that I may have had prior to actually becoming an employee) with the Company in any capacity and that is and has been a material part of the consideration for my employment by Company:

1. I have not entered into, and I agree I will not enter into, any agreement either written or oral in conflict with this Agreement or my employment with Company. I will not violate any agreement with or rights of any third party or, except as expressly authorized by Company in writing hereafter, use or disclose my own or any third party's confidential information or intellectual property when acting within the scope of my employment or otherwise on behalf of Company. Further, I have not retained anything containing any confidential information of a prior employer or other third party, whether or not created by me.

2. Company shall own all right, title and interest (including patent rights, copyrights, trade secret rights, mask work rights , *sui generis* database rights and all other intellectual property rights of any sort throughout the world) relating to any and all inventions (whether or not patentable), works of authorship, mask works, designs, know-how, ideas and information made or conceived or reduced to practice, in whole or in part, by me during the term of my employment with Company to and only to the fullest extent allowed by California Labor Code Section 2870 (which is attached as Appendix A) (collectively "Inventions") and I will promptly disclose all Inventions to Company. Without disclosing any third party confidential information, I will also disclose anything I believe is excluded by Section 2870 so that the Company can make an independent assessment. I hereby make all assignments necessary to accomplish the foregoing. I shall further assist Company, at Company's expense, to further evidence, record and perfect such assignments, and to perfect, obtain, maintain, enforce, and defend any rights specified to be so owned or assigned. I hereby irrevocably designate and appoint Company as my agent and attorney-in-fact, coupled with an interest and with full power of substitution, to act for and in my behalf to execute and file any document and to do all other lawfully permitted acts to further the purposes of the foregoing with the same legal force and effect as if executed by me. Without limiting Section 1 or Company's other rights and remedies, if, when acting within the scope of my employment or otherwise on behalf of Company, I use or disclose my own or any third party's confidential information or intellectual property (or if any Invention cannot be fully made, used, reproduced, distributed and otherwise exploited without using or violating the foregoing), Company will have and I hereby grant Company a perpetual, irrevocable, worldwide royalty-free, non-exclusive, sublicensable right and license to exploit and exercise all such confidential information and intellectual property rights.

3. To the extent allowed by law, paragraph 2 includes all rights of paternity, integrity, disclosure and withdrawal and any other rights that may be known as or referred to as "moral rights," "artist's rights," "droit moral," or the like (collectively "Moral Rights"). To the extent I retain any such Moral Rights under applicable law, I hereby ratify and consent to any action that may be taken with respect to such Moral Rights by or authorized by Company and

agree not to assert any Moral Rights with respect thereto. I will confirm any such ratifications, consents and agreements from time to time as requested by Company.

4. I agree that all Inventions and all other business, technical and financial information (including, without limitation, the identity of and information relating to customers or employees) I develop, learn or obtain during the term of my employment that relate to Company or the business or demonstrably anticipated business of Company or that are received by or for Company in confidence, constitute "Proprietary Information." I will hold in confidence and not disclose or, except within the scope of my employment, use any Proprietary Information. However, I shall not be obligated under this paragraph with respect to information I can document is or becomes readily publicly available without restriction through no fault of mine. Upon termination of my employment, I will promptly return to Company all items containing or embodying Proprietary Information (including all copies), except that I may keep my personal copies of (i) my compensation records, (ii) materials distributed to shareholders generally and (iii) this Agreement. I also recognize and agree that I have no expectation of privacy with respect to Company's telecommunications, networking or information processing systems (including, without limitation, stored computer files, email messages and voice messages) and that my activity and any files or messages on or using any of those systems may be monitored at any time without notice.

5. Until one year after the term of my employment, I will not encourage or solicit any employee or consultant of Company to leave Company for any reason (except for the bona fide firing of Company personnel within the scope of my employment).

6. I agree that during the term of my employment with Company (whether or not during business hours), I will not engage in any activity that is in any way competitive with the business or demonstrably anticipated business of Company, and I will not assist any other person or organization in competing or in preparing to compete with any business or demonstrably anticipated business of Company.

7. I agree that this Agreement is not an employment contract for any particular term and that I have the right to resign and Company has the right to terminate my employment at will, at any time, for any or no reason, with or without cause. In addition, this Agreement does not purport to set forth all of the terms and conditions of my employment, and, as an employee of Company, I have obligations to Company which are not set forth in this Agreement. However, the terms of this Agreement govern over any inconsistent terms and can only be changed by a subsequent written agreement signed by the President of Company.

8. I agree that my obligations under paragraphs 2, 3, 4 and 5 of this Agreement shall continue in effect after termination of my employment, regardless of the reason or reasons for termination, and whether such termination is voluntary or involuntary on my part, and that Company is entitled to communicate my obligations under this Agreement to any future employer or potential employer of mine. My obligations under paragraphs 2, 3 and 4 also shall be binding upon my heirs, executors, assigns, and administrators and shall inure to the benefit of Company, its subsidiaries, successors and assigns.

9. Any dispute in the meaning, effect or validity of this Agreement shall be resolved in accordance with the laws of the State of California without regard to the conflict of laws provisions thereof. I further agree that if one or more provisions of this Agreement are held to be illegal or unenforceable under applicable California law, such illegal or unenforceable portion(s) shall be limited or excluded from this Agreement to the minimum extent required so that this Agreement shall otherwise remain in full force and effect and enforceable in accordance with its terms. This Agreement is fully assignable and transferable by Company, but any purported assignment or transfer by me is void. I also understand that any breach of this Agreement will cause irreparable harm to Company for which damages would not be a adequate remedy, and, therefore, Company will be entitled to injunctive relief with respect thereto in addition to any other remedies and without any requirement to post bond.

NOTICE: This agreement does not affect any immunity under 18 USC Sections 1833(b) (1) or (2), which read as follows (note that for purposes of this statute only, individuals performing work as contractors or consultants are considered to be employees): (1) An individual shall not be held criminally or civilly liable under any Federal or State trade secret law for the disclosure of a trade secret that (A) is made (i) in confidence to a Federal, State, or local government official, either directly or indirectly, or to an attorney; and (ii) solely for the purpose of reporting or investigating a suspected violation of law; or (B) is made in a complaint or other document filed in a lawsuit or other proceeding, if such filing is made under seal. (2) An individual who files a lawsuit for retaliation by an employer for reporting a suspected violation of law may disclose the trade secret to the attorney of the individual and use the trade secret information in the court proceeding, if the individual (A) files any document containing the trade secret under seal; and (B) does not disclose the trade secret, except pursuant to court order.

I HAVE READ THIS AGREEMENT CAREFULLY AND I UNDERSTAND AND ACCEPT THE OBLIGATIONS WHICH IT IMPOSES UPON ME WITHOUT RESERVATION. NO PROMISES OR REPRESENTATIONS HAVE BEEN MADE TO ME TO INDUCE ME TO SIGN THIS AGREEMENT. I SIGN THIS AGREEMENT VOLUNTARILY AND FREELY, IN DUPLICATE, WITH THE UNDERSTANDING THAT THE COMPANY WILL RETAIN ONE COUNTERPART AND THE OTHER COUNTERPART WILL BE RETAINED BY ME.

April 17, 2017

Employee

/s/ Steven Chan
Signature

Steven Chan
Name (Printed)

Accepted and Agreed to:

ARCUS BIOSCIENCES, INC.

By: /s/ Juan C. Jaen
Juan C. Jaen, President

APPENDIX A

California Labor Code Section 2870. **Application of provision providing that employee shall assign or offer to assign rights in invention to employer.**

(a) Any provision in an employment agreement which provides that an employee shall assign, or offer to assign, any of his or her rights in an invention to his or her employer shall not apply to an invention that the employee developed entirely on his or her own time without using the employer's equipment, supplies, facilities, or trade secret information except for those inventions that either:

(1). Relate at the time of conception or reduction to practice of the invention to the employer's business, or actual or demonstrably anticipated research or development of the employer; or

(2). Result from any work performed by the employee for his employer.

(b) To the extent a provision in an employment agreement purports to require an employee to assign an invention otherwise excluded from being required to be assigned under subdivision (a), the provision is against the public policy of this state and is unenforceable.

Exhibit 23.1

Consent of Independent Registered Public Accounting Firm

We consent to the incorporation by reference in the Registration Statement (Form S-8 No. 333-223746) pertaining to the Arcus Biosciences, Inc. 2018 Equity Incentive Plan, the Arcus Biosciences, Inc. Amended and Restated 2015 Stock Plan, and the Arcus Biosciences, Inc. 2018 Employee Stock Purchase Plan of our report dated March 5, 2019, with respect to the consolidated financial statements of Arcus Biosciences, Inc. included in this Annual Report (Form 10-K) for the year ended December 31, 2018.

/s/ Ernst & Young LLP

Redwood City, California
March 5, 2019

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, Terry Rosen, certify that:

1. I have reviewed this Form 10-K of Arcus Biosciences, 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 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) 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

   (c) 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 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 5, 2019

By: /s/ Terry Rosen

Terry Rosen, Ph.D.
Chief Executive Officer
(Principal 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, Steven Chan, certify that:

1. I have reviewed this Form 10-K of Arcus Biosciences, 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 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) 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

   (c) 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 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 5, 2019

By: /s/ Steven Chan

Steven Chan
Principal Financial & Accounting 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 Arcus Biosciences, Inc. (the "Company") on Form 10-K for the period ending December 31, 2018 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 15(d) of the Securities Exchange Act of 1934; 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 5, 2019

By: /s/ Terry Rosen

Terry Rosen, Ph.D.
Chief Executive Officer
(Principal Executive Officer)

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 Arcus Biosciences, Inc. (the "Company") on Form 10-K for the period ending December 31, 2018 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 15(d) of the Securities Exchange Act of 1934; 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 5, 2019

By: /s/ Steven Chan

Steven Chan
Principal Financial & Accounting Officer