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 001-37998

JOUNCE THERAPEUTICS, INC.

(Exact name of registrant as specified in its charter)

Delaware	**45-4870634**
(State or other jurisdiction of incorporation or organization)	**(I.R.S. Employer Identification No.)**
780 Memorial Drive Cambridge, Massachusetts	**02139**
(Address of principal executive offices)	**(Zip Code)**

Registrant's telephone number, including area code: (857) 259-3840

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

Title of each class	**Name of each exchange on which registered**
Common Stock, $0.001 par value per share	**Nasdaq Global Select Market**

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

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

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

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

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

Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K (§ 229.405 of this chapter) 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, a 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 Act). Yes ☐ No ☒

As of June 29, 2018, the last business day of the registrant's most recently completed second fiscal quarter, the aggregate market value of the registrant's Common Stock held by non-affiliates of the registrant was approximately $120,393,951, based upon the closing price of the registrant's Common Stock on June 29, 2018.

As of March 1, 2019, there were 32,972,345 shares of common stock, $0.001 par value per share, outstanding.

Documents Incorporated by Reference

Portions of the registrant's Definitive Proxy Statement on Schedule 14A relating to its 2019 Annual Meeting of Stockholders to be filed within 120 days of the end of the registrant's fiscal year ended December 31, 2018 are incorporated by reference into Part III of this Annual Report on Form 10-K to the extent stated herein.

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References to Jounce

Throughout this Annual Report on Form 10-K, the "Company," "Jounce," "Jounce Therapeutics," "we," "us," and "our," except where the context requires otherwise, refers to Jounce Therapeutics, Inc. and its consolidated subsidiary, and "our board of directors" refers to the board of directors of Jounce Therapeutics, Inc.

Cautionary Note Regarding Forward-Looking Statements and Industry Data

This Annual Report on Form 10-K contains forward-looking statements that involve substantial risks and uncertainties. All statements other than statements of historical facts contained in this Annual Report on Form 10-K, including statements regarding our strategy, future operations, future financial position, future revenue, projected costs, prospects, plans, objectives of management and expected market growth, are forward-looking statements. These statements involve known and unknown risks, uncertainties and other important factors that may cause our actual results, performance or achievements to be materially different from any future results, performance or achievements expressed or implied by the forward-looking statements.

The words "anticipate," "believe," "estimate," "expect," "intend," "may," "plan," "predict," "project," "would", "will," "target", "goal", "could," "should, "potential," "continue" and similar expressions are intended to identify forward-looking statements, although not all forward-looking statements contain these identifying words. These forward-looking statements include, among other things, statements about:

- the timing, progress, and results of preclinical studies and clinical trials for vopratelimab (formerly JTX-2011), JTX-4014, JTX-8064 and any other product candidates we may develop, including statements regarding the timing of initiation and completion of studies or trials and related preparatory work, the period during which the results of the trials will become available, and our research and development programs;
- the timing, scope, or likelihood of regulatory filings and approvals, including, as applicable, timing of our investigational new drug application for, biologics license application filing for, and final Food and Drug Administration approval of vopratelimab, JTX-4014, JTX-8064 and other future product candidates;
- our ability to use our Translational Science Platform to identify targets for future product candidates and to match immunotherapies to select patient subsets;
- our ability to identify, develop and advance future product candidates into, and successfully complete, clinical studies;
- our ability to develop combination therapies, whether on our own or in collaboration with Celgene Corporation, or Celgene, and other third parties, for vopratelimab, JTX-4014 and JTX-8064;
- our expectations regarding the size of the patient populations for vopratelimab, JTX-4014 and JTX-8064, if approved for commercial use, and any product candidates we may develop;
- our commercialization and marketing capabilities and strategy;
- the pricing and reimbursement of vopratelimab, JTX-4014, JTX-8064 and any product candidates we may develop, if approved;
- the implementation of our business model and our strategic plans for our business, vopratelimab, JTX-4014, JTX-8064 and any product candidates we may develop, and our technology;
- our ability to develop and commercialize a companion diagnostic or complementary diagnostic for vopratelimab, JTX-4014, JTX-8064 and any product candidates we may develop;
- the rate and degree of market acceptance and clinical utility of vopratelimab, JTX-4014, JTX-8064 and any product candidates we may develop;
- the potential benefits of and our ability to maintain our collaboration with Celgene, and the impact of the anticipated acquisition of Celgene by Bristol-Myers Squibb Company on our collaboration;
- our ability to establish or maintain future collaborations or strategic relationships or obtain additional funding;
- our ability to retain the continued service of our key professionals and to identify, hire and retain additional qualified professionals;

- our intellectual property position, including the scope of protection we are able to establish and maintain for intellectual property rights covering vopratelimab, JTX-4014, JTX-8064 and any product candidates we may develop, and our ability not to infringe, misappropriate or otherwise violate any third-party intellectual property rights;
- our competitive position, and developments and projections relating to our competitors and our industry;
- our estimates regarding expenses, future revenue, capital requirements and needs for additional financing; and
- the impact of laws and regulations.

There are a number of important risks and uncertainties that could cause our actual results to differ materially from those indicated by forward-looking statements. We may not actually achieve the plans, intentions or expectations disclosed in our forward-looking statements, and you should not place undue reliance on our forward-looking statements. Actual results or events could differ materially from the plans, intentions and expectations disclosed in the forward-looking statements we make. We have included important factors in the cautionary statements included in this Annual Report on Form 10-K, particularly in the section entitled “Risk Factors” in Part I, Item 1A that could cause actual results or events to differ materially from the forward-looking statements that we make. Our forward-looking statements do not reflect the potential impact of any future acquisitions, mergers, dispositions, joint ventures or investments that we may make.

You should read this Annual Report on Form 10-K and the documents that we have filed as exhibits to this Annual Report on Form 10-K completely and with the understanding that our actual future results may be materially different from what we expect. The forward-looking statements contained in this Annual Report on Form 10-K are made as of the date of this Annual Report on Form 10-K, and we do not assume any obligation to update any forward-looking statements, whether as a result of new information, future events or otherwise, except as required by applicable law.

This Annual Report on Form 10-K may include industry and market data, which we may obtain from our own internal estimates and research, as well as from industry and general publications and research, surveys, and studies conducted by third parties. Industry publications, studies, and surveys generally state that they have been obtained from sources believed to be reliable, although they do not guarantee the accuracy or completeness of such information. While we believe that such studies and publications are reliable, we have not independently verified market and industry data from third-party sources.

Website and Social Media Disclosure

From time to time, we may use our website (www.jouncetx.com), investor and media relations website (http://ir.jouncetx.com), Facebook page (https://www.facebook.com/jouncetx), LinkedIn page (https://www.linkedin.com/company/3494537/) and Twitter feed (https://twitter.com/JounceTx) as channels for the distribution of information. The information we post through these channels may be deemed material. Accordingly, investors should monitor these channels, in addition to following our press releases, Securities and Exchange Commission filings and public conference calls and webcasts. The contents of our website and social media channels are not, however, a part of this report.

PART I

Item 1. Business

Overview

We are a clinical-stage immunotherapy company dedicated to transforming the treatment of cancer by developing therapies that enable the immune system to attack tumors and provide long-lasting benefits to patients. We have developed a suite of integrated technologies that comprise our Translational Science Platform, enabling us to comprehensively interrogate the cellular and molecular composition of tumors. By focusing on specific cell types, both immune and non-immune, within tumors, we can prioritize targets and then identify related biomarkers designed to match the right therapy to the right patient. Through this scientific understanding of the tumor microenvironment, or TME, our goal is to effectively and efficiently identify and develop new cancer immunotherapies designed to benefit patients with tumors across the spectrum from highly inflamed, or "hot," to poorly inflamed, or "cold," and especially those not well served by current therapies.

Our most advanced product candidate, vopratelimab (formerly JTX-2011), is a clinical-stage monoclonal antibody that binds to and activates the **I**nducible T cell **CO-S**timulator, or ICOS, a protein on the surface of certain T cells commonly found in many solid tumors. Vopratelimab was assessed in a Phase 1/2 clinical trial that we refer to as ICONIC. In the initial Phase 1/2 portion of ICONIC, vopratelimab was found to be safe and well-tolerated, both alone and in combination with nivolumab, an anti-PD-1 antibody. At the June 2018 annual meeting of the American Society of Clinical Oncology, or ASCO, we reported Response Evaluation Criteria in Solid Tumors, or RECIST, responses and other tumor reductions as determined by investigator assessment that were associated with an ICOS pharmacodynamic biomarker. We subsequently reported that these responses were durable, lasting six or more months and that all responders, as determined by investigator assessments, remained on study for more than one year. ICONIC also includes an on-going dose-escalation Phase 1 portion to assess vopratelimab in combination with pembrolizumab, an anti-PD-1 antibody, and in combination with ipilimumab, an antibody that binds to CTLA-4 on certain T cells. This Phase 1 portion established the safety of vopratelimab in combination with each of ipilimumab and pembrolizumab. We plan to initiate additional Phase 2 clinical studies, including one or more new dosing schedules and combination sequences, in 2019 and expect to report preliminary efficacy data from these additional clinical studies in 2020. These anticipated Phase 2 clinical studies will evaluate vopratelimab in combination with ipilimumab, and, separately, using a predictive biomarker approach, will evaluate vopratelimab alone and/or in combination with a PD-1 inhibitor. These additional clinical studies are designed to determine whether vopratelimab can offer a treatment alternative to patients who otherwise do not display an effective response to currently approved therapies, and/or whether it can enhance the therapeutic benefit of currently approved therapies.

Our second product candidate, JTX-4014, is a clinical-stage anti-PD-1 antibody that we are developing primarily for potential use in combination with future product candidates, as we believe that combination therapy has the potential to be a mainstay of cancer immunotherapy. We are currently conducting a Phase 1 clinical trial of JTX-4014 monotherapy and completed enrollment in the first cohort in the fourth quarter of 2018. This Phase 1 clinical trial is designed to assess safety and to determine the recommended Phase 2 dose. We expect to identify the recommended Phase 2 dose in 2019.

JTX-8064, our third product candidate, is an antibody that binds to LILRB2, which is a cell surface receptor expressed on macrophages. JTX-8064 is the first tumor-associated macrophage candidate to emerge from our Translational Science Platform. We believe therapies targeting these innate immune cells may have the potential to benefit patients with tumors that are less likely to respond to existing T cell-focused approaches. We are currently conducting IND-enabling activities for JTX-8064, with the goal of filing an investigational new drug application, or IND, and initiating a Phase 1 clinical trial in 2019.

Our strategy is to use a biomarker-driven approach from discovery through clinical development. We leverage our Translational Science Platform to interrogate cell types within the human tumor microenvironment and to identify and prioritize targets across a broad spectrum of immune and non-immune cell types. In addition, early in the development process, we use our Translational Science Platform to identify potential predictive biomarkers to enable us to enrich our clinical trials for patient populations that may be more likely to respond to a particular immunotherapy. We can also use characteristics defined by our biomarker efforts to focus on niche indications and/or niche subsets within indications to inform our clinical strategy. Once clinical data is available for a product candidate, we then use a reverse translational approach to interrogate tumor and blood samples from patients with known outcomes. By using these reverse translational findings, we believe we are better able to design clinical trials and more efficiently develop cancer immunotherapies that potentially provide greater benefit to patients. We believe that the biomarker results, coordinated

to clinical response, will assist with determining the utility of proceeding to the use of a complementary diagnostic and/or companion diagnostic for a given therapy.

We have assembled a highly-experienced internal and external team of experts in immunotherapy to help us leverage our Translational Science Platform to drive the development of our early discovery programs and our product candidates, including vopratelimab. Two of our founders, Dr. James Allison and Dr. Padmanee Sharma of the University of Texas MD Anderson Cancer Center, were initially responsible for the translational science behind ICOS. Dr. Allison played a fundamental role in ushering in the era of immune checkpoint therapy, including contributing to the understanding of the basic science of CTLA-4 that supported the development of ipilimumab, marketed as Yervoy. In 2018, Dr. Allison was awarded the Nobel Prize in Physiology or Medicine for his work related to the discovery of cancer therapy by inhibition of negative immune regulation.

Our ability to prioritize targets and potential predictive biomarkers using our Translational Science Platform helped lead to our strategic collaboration with Celgene Corporation, or Celgene. This global strategic collaboration, which included a $225.0 million upfront payment and a $36.1 million equity investment, is primarily focused on co-developing and co-commercializing innovative biologic immunotherapy treatments for patients with cancer. Under the agreement, we granted Celgene exclusive options to develop and commercialize our lead product candidate, vopratelimab, and up to four early-stage programs consisting of targets to be selected from a pool of certain B cell, T regulatory cell and tumor-associated macrophage targets, including JTX-8064. Additionally, Celgene has an exclusive option to develop and commercialize JTX-4014, which, upon exercise of such option, will be a shared program that may be used by both parties within and outside of the collaboration. Under the terms of the agreement, if Celgene exercises all of its options, all programs meet all milestones, including regulatory approvals in the United States and outside the United States, and Celgene extends the initial four-year research term for three additional years, we are eligible to earn up to approximately $2.6 billion in clinical, regulatory, and/or commercialization milestone payments, option-exercise fees and research term extension fees. In January 2019, Celgene and Bristol-Myers Squibb Company, or BMS, announced that they had entered into an agreement under which Celgene will be acquired by BMS, subject to shareholder and regulatory approvals. If the transaction closes, we anticipate that the acquisition of Celgene by BMS may change the dynamics of our collaboration, given the overlap of our product candidates and therapies in BMS's pipeline. We expect that the acquisition may have a positive impact on our business if we successfully develop a relationship with BMS, a leader in the immuno-oncology field. In the event that BMS or Celgene chooses not to exercise some or all of the rights to the optioned programs, we will retain one hundred percent of the worldwide rights for the non-optioned programs and may advance them on our own or potentially with a new partner. In addition to progressing collaboration programs, we will continue to use our Translational Science Platform to progress our own programs that are not part of the collaboration and for which we retain worldwide commercial rights.

Our Strategy

We aim to build a multi-product company that discovers, develops and commercializes first-in-class and/or best in class novel therapeutics and combination approaches for patients who are less likely to respond, or who have experienced limited or no response, to currently-approved immunotherapies. Key elements of our strategy include:

- Aggressively develop our product candidates, and potential future product candidates, using a biomarker-driven approach and reverse translational analysis aimed at bringing the right immunotherapy to the right patients;
- Continue our investment in our Translational Science Platform to enhance our understanding of the TME, as we look to broaden the benefit of immunotherapy through targeting additional cell types;
- Address the unmet need of cancer patients with tumors unresponsive to T effector cell-directed therapies by focusing our discovery efforts on other cell types within the TME; and
- Expand our pipeline by leveraging our internal discovery platform and/or in-licensing new technologies, product candidates and methodologies.

Immuno-Oncology Overview

Historically, cancer treatments have focused on either killing or arresting the proliferation of the tumor cells themselves. However, fundamental work pioneered by one of our founders, Dr. Allison, led to the discovery of one of the first immune cell checkpoint therapies. Immune checkpoint inhibitors show promise in treating various cancers, including immunotherapies that bind to the PD-1 or PD-L1 receptor on certain T cells, and are approved in multiple cancer types and across different lines of therapy.

Even with the success of these antibodies that bind to PD-1 or PD-L1, known as PD-1 checkpoint inhibitors, there is still a significant unmet need. Data emerging from clinical studies with these PD-1 checkpoint inhibitors suggests the importance of a biomarker-driven patient-enrichment strategy, like that used for pembrolizumab, in first-line non-small cell lung cancer subjects and in second line microsatellite-instability-high, or MSI-H, cancer patient populations. Additional highlights of the evolving immunotherapy landscape include longer-lasting responses as compared to chemotherapy and that these longer-lasting responses can be improved with combination therapy.

The interplay between the immune system and cancer is dynamic and as more patients, in an expanded set of indications, are being exposed to cancer immunotherapies we are learning about the factors that may contribute to a lack of response or a failed response. Reasons for resistance to immunotherapy may include a lack of appropriate immune cells in the TME, for example, the absence of T effector cells, or the presence of immunosuppressive cells, such as tumor associated macrophages or T regulatory cells. In these cases, therapeutic approaches that target other cell types within the TME to convert colder tumors to hot tumors may broaden the applicability of cancer immunotherapies. In addition, a tumor may initially respond to a PD-1 checkpoint inhibitor immunotherapy, but other immune checkpoints may emerge or an acquired resistance to the particular immunotherapy may occur, for example through genetic alterations in key T cell signaling pathways. In these instances, combination therapy approaches that target more than one checkpoint, or more than one mechanism, may be key to maximizing the benefit of cancer immunotherapies.

We believe that our Translational Science Platform, which enables both the identification and prioritization of targets across a broad spectrum of immune and non-immune cell types and the identification of potential biomarkers to inform our clinical development strategy, may position us to address multiple pathways and indications, including those that may be important in colder tumors, and to identify the most appropriate indications and most responsive patient populations for our new immunotherapies. By taking this dual approach, we believe we may be able to address areas of unmet need, particularly in the combination setting.

The promise of long-lasting benefit to cancer patients has led to heightened enthusiasm for these types of immunotherapy products and the rapid expansion of the market opportunity. The overall market for immunotherapy is expected to expand over the next five years, with 2024 market size estimates ranging from $41 billion to $58 billion across solid and blood-based tumors according to market reports.

Our Product Pipeline

We are developing a pipeline of immunotherapies that we believe will provide a meaningful and long-lasting benefit to cancer patients. We plan to develop each of these as a single agent and/or in combination with other therapies, as applicable. The following table depicts our current pipeline:

Development Programs

Program	Target	Biology	Preclinical	Clinical		
				Phase 1	Phase 2	Phase 3
Vopratelimab (JTX-2011)	ICOS	CD4 T cell focused				
JTX-4014	PD-1	CD8 T cell focused				
JTX-8064	LILRB2	Suppressive macrophage, colder tumor				

Named Celgene Option Celgene Target Pool

Discovery Programs

Target	Rights
Stromal	Jounce Wholly-owned
Macrophage, B-cell, T-reg	Celgene Target Pool

Development Programs

Lead Program Vopratelimab: An Anti-ICOS Monoclonal Antibody Immunotherapy

Our most advanced product candidate, vopratelimab, is a clinical-stage monoclonal antibody that binds to and activates ICOS, a protein on the surface of certain T cells commonly found in many solid tumors. Vopratelimab was assessed in a Phase 1/2 clinical trial that we refer to as ICONIC. In the initial Phase 1/2 portion of ICONIC, vopratelimab was found to be safe and well-tolerated, both alone and in combination with nivolumab. ICONIC also includes an on-going dose-escalation Phase 1 portion to assess the safety of vopratelimab in combination with each of pembrolizumab and ipilimumab. We plan to initiate additional Phase 2 clinical studies, including one or more new dosing schedules and combination sequences, in 2019, and expect to report preliminary efficacy data from these additional clinical studies in 2020. These anticipated Phase 2 clinical studies are designed to evaluate vopratelimab in combination with ipilimumab in patients who have previously received a PD-1 checkpoint inhibitor therapy and who have either non-small cell lung cancer or bladder cancer, and, separately, using a predictive biomarker approach, to evaluate vopratelimab alone and/or in combination with a PD-1 inhibitor in patients with multiple tumor types. These trials aim to determine whether vopratelimab can offer a treatment alternative to patients who otherwise do not display an effective response to currently approved therapies, and/or whether it can enhance the therapeutic benefit of currently approved therapies.

At the June 2018 ASCO annual meeting, we presented preliminary efficacy data and safety data from ICONIC, comprised of data across multiple tumor types from all evaluable patients as of April 4, 2018. Patients were heavily pre-treated, with approximately 65 percent having received three or more prior therapies and approximately 65 percent discontinuing during the first three cycles. In gastric cancer, a RECIST partial response with vopratelimab monotherapy was observed in one of eight Phase 2 patients, and two RECIST partial responses with vopratelimab plus nivolumab were observed in one of four Phase 1 patients and one of 28 Phase 2 patients. In triple negative breast cancer, or TNBC, a RECIST partial response with vopratelimab plus nivolumab was observed in one of 17 Phase 2 patients. All RECIST partial responses were based on investigator assessments and were observed in patients who had not previously received a PD-1 checkpoint inhibitor treatment. Additionally, based on investigator assessments, tumor reductions were observed in eight of 28 Phase 2 gastric cancer patients treated with vopratelimab plus nivolumab, in two of 17 Phase 2 TNBC patients treated with vopratelimab plus nivolumab, in one of 16 Phase 2 head and neck squamous cell cancer patients treated with vopratelimab plus nivolumab and in four of 12 Phase 2 non-small cell lung cancer patients treated with vopratelimab plus nivolumab. Preliminary signals of clinical activity with vopratelimab monotherapy and in combination with nivolumab were observed, accompanied by an ICOS pharmacodynamic biomarker, specifically the emergence of CD4 T cells in the peripheral blood with a high expression of ICOS per T cell, which we refer to as ICOS hi CD4 T cells. All responses, as determined by investigator assessments, have been durable lasting six or more months, and all responders, as determined by investigator assessments, remained on study for more than one year. Additionally, vopratelimab was well tolerated alone and in combination with nivolumab, and the overall safety profile observed was consistent with data from ICONIC previously reported at the 2017 ASCO annual meeting. In the first half of 2019, we expect to provide incremental data from ICONIC, as well as an update on overall survival data and progression-free survival data, and their relationship to the emergence of ICOS hi CD4 T cells.

Consistent with the inducible nature of ICOS, data from Drs. Sharma and Allison and others suggest that ICOS can be upregulated on T cells following exposure to certain agents, such as ipilimumab, and our *ex vivo* studies indicate that a high expression of ICOS per T cell is necessary for vopratelimab to drive the activation of T effector cells. Through reverse translational analysis, we believe we have identified an association between the emergence of ICOS hi CD4 T cells and clinical response to vopratelimab. We conducted an analysis of the populations of CD4 T cells in the blood of a subset of ICONIC patients with evaluable samples that demonstrated the emergence of ICOS hi CD4 T cells in all patients who had a target lesion reduction of 30 percent or greater, and that the emergence of these cells was not detectable in patients with target lesion progression. This subset of patients included those treated with vopratelimab monotherapy, as well as vopratelimab in combination with nivolumab. In order to examine the possible role of PD-1 checkpoint inhibitors in the emergence of ICOS hi CD4 T cells, we conducted a separate study of blood samples from responding and non-responding patients who received PD-1 checkpoint inhibitor monotherapy treatment. In this study, no emergence of ICOS hi CD4 T cells was observed, suggesting that the emergence of this cell population is attributable to activity of vopratelimab. Furthermore, in an *ex vivo* study of peripheral blood mononuclear cells, or PBMCs, PBMCs from healthy donors were stimulated and divided into ICOS hi and ICOS lo CD4 T cell populations and then treated with vopratelimab. This *ex vivo* data demonstrated that vopratelimab induced a polyfunctional cytokine response only in the ICOS hi CD4 T cells and not in the ICOS lo CD4 T cells, suggesting that combining vopratelimab with agents that induce ICOS hi CD4 T cells, such as ipilimumab, may increase proliferation and activity of these cells, which may lead to clinical benefit in a greater number of patients.

Based on our reverse translation work, clinical studies along two development paths are planned for vopratelimab in 2019. Specifically, we intend to combine ipilimumab, an agent that induces ICOS hi CD4 T cells, with vopratelimab to potentially induce a population of ICOS hi CD4 T cells that may be more likely to respond when treated with vopratelimab. In addition, we plan to assess vopratelimab as a monotherapy and/or in combination with a PD-1 checkpoint inhibitor, and we anticipate selecting patients using potential predictive biomarkers that were identified by analyzing baseline blood and tumor samples from patients treated in ICONIC and comparing baseline samples from patients who had emergence of ICOS hi CD4 T cells and those who did not.

JTX-4014: An Anti-PD-1 Antibody for Combination Therapy

Combination therapy aimed at multiple targets has become an important element of immunotherapy development efforts with the goal of creating even better, long-lasting responses. PD-1 checkpoint inhibitors are anticipated to play a key role in combination therapies. For this reason, we are developing our own anti-PD-1 antibody, JTX-4014, primarily for use in combinations with potential future product candidates. We believe this will give us greater flexibility to develop our pipeline of therapies.

We are currently conducting a Phase 1 clinical trial of JTX-4014 monotherapy and completed enrollment in the first cohort in the fourth quarter of 2018. This Phase 1 clinical trial is designed to assess safety and determine the recommended Phase 2 dose of JTX-4014. We expect to identify the recommended Phase 2 dose in 2019.

JTX-8064: An Anti-LILRB2 Monoclonal Antibody Immunotherapy

In early 2018, we commenced IND-enabling activities for JTX-8064, a monoclonal antibody binding to LILRB2. JTX-8064 is the first potential candidate to emerge from our macrophage-focused efforts, and we have generated encouraging *in vitro* data and *ex vivo* data using human tumor histoculture.

Immunosuppressive macrophages are highly prevalent in many solid tumor types and their presence is associated with poorer disease prognosis. Therefore, we prioritized macrophage targets for our initial foray into developing more effective cancer therapies to address the unmet needs of patients with tumors that are less likely to respond to existing therapeutic approaches that focus on T effector cells alone. Using our Translational Science Platform, we identified LILRB2 as a potential macrophage checkpoint. When LILRB2 binds to its ligands, such as HLA-G, an immunosuppressive state is created. Like other important immune checkpoints, PD-L1 and CTLA-4, HLA-G has been shown to play a key role in fetal-maternal tolerance and thus may also represent an important immune evasion strategy employed by tumors. By inhibiting the binding of LILRB2 to its ligands, we hope to release the brakes on this immunosuppressive interaction, resulting in a reprogramming of the macrophages from an immuno-suppressive, or M2, phenotype to immuno-stimulatory, or M1, phenotype, which is characterized by enhanced microbicidal or tumorcidal capacity and high levels of pro-inflammatory cytokine secretion. Our goal is to convert, but not deplete, immune-suppressing M2 macrophages to immune-enhancing M1 macrophages, thus engaging the innate immune system in the response to cancer. We expect to file an IND and initiate a Phase 1 trial for JTX-8064 in 2019.

Discovery Programs

With our focus on bringing the right immunotherapy to the right patients, we have invested heavily in our Translational Science Platform as we believe that the systematic interrogation of the immune make-up of human tumors gives us the ability to target different cell types within the TME beyond the T effector cells that are the focus of currently approved immunotherapies. This may enable us to fully exploit the promise of immunotherapy in cancer by allowing us to pursue tumor types not currently served by therapies that target the T effector arm of the adaptive immune system, as well as potentially convert the TME from an immunosuppressive environment to an immune activating environment and thereby convert cold tumors to hot tumors.

Analysis of The Cancer Genome Atlas, or TCGA, using our proprietary gene signatures, which represent various immune cells, shows that the immune cell composition of tumors is diverse, both across and within indications, and suggests that a significant number of tumors, including cold tumors in particular, may not benefit from the current T-cell focused immunotherapies, such as PD-1 checkpoint inhibitors.

We are leveraging our Translational Science Platform to systematically and comprehensively interrogate cell types within the TME, including non-immune cells such as stromal cells, with the goal of enabling us to develop therapies to benefit patients with tumors across the hot to cold spectrum. We believe that some of our discovery approaches, including targeting stromal cells, may identify product candidates with the potential to address a significant unmet medical need by turning cold tumors hot and making them amenable to PD-1 checkpoint inhibitors, such as JTX-4014, and other immunotherapies.

Strategic Alliance with Celgene

In July 2016, we entered into a Master Research and Collaboration Agreement, or the Celgene Collaboration Agreement, with Celgene. The primary goal of the collaboration is to co-develop and co-commercialize innovative biologic immunotherapies that either activate or suppress the immune system by binding to targets identified by leveraging our Translational Science Platform. Under the agreement, we granted Celgene exclusive options to develop and commercialize our lead product candidate, vopratelimab, and up to four early-stage programs consisting of targets to be selected from a pool of certain B cell, T regulatory cell and tumor-associated macrophage targets, including JTX-8064. Additionally, Celgene has an exclusive option to develop and commercialize our product candidate JTX-4014, which, upon exercise of such option, will be a shared program that may be used by both parties in and outside of the collaboration. Prior to Celgene exercising an option for a program, we are responsible for all research and development activities for that program under the agreement during the collaboration, and subject to all costs and potential liabilities.

Advancement of biologics: For programs that have biologics that meet mutually agreed criteria for suitability for further development, Celgene may elect that program's target (solely with respect to immune activation or immune suppression, as applicable) to be added to the pool of targets for which we may conduct further research subject to the terms of the collaboration. If we continue to conduct research and development for such programs, then such activity will be part of the collaboration. If Celgene does not elect a program that achieves such criteria, then we will retain the rights to such program's targets and biologics and Celgene will not have an option to such program.

Exercise of options and further development of programs: Celgene may extend the initial four-year research term of the collaboration for up to three additional one-year periods upon payment of an extension fee for each additional year. Celgene may exercise its option for a program at any time until the expiration of an option term for that program. For each program, the option term ends 45 to 60 days following Celgene's receipt of a data package that includes certain information relating to the program's research and development activities. The data package for a program may be delivered to Celgene after the applicable development milestone for such program has been achieved. Depending on the program, the applicable development milestone is (i) IND acceptance, (ii) availability of certain Phase 1a data, or (iii) availability of certain Phase 1/2 data. If Celgene fails to exercise its option during the option term for a program, we will retain the rights to such program. If Celgene exercises its option for a program other than JTX-4014, then we will enter into a co-development and co-commercialization agreement with Celgene for such program in substantially the form attached to the agreement as an exhibit. Under the co-development and co-commercialization agreement for vopratelimab and one additional program for which Celgene opts in that is not JTX-4014, we will be responsible for leading development and commercialization activities in the United States and Celgene will be responsible for development and commercialization activities outside the United States. For all other additional programs for which Celgene opts in, other than JTX-4014, Celgene will lead development and commercialization activities worldwide. If Celgene exercises its option for JTX-4014, we will enter into a license agreement, in substantially the form attached to the agreement as an exhibit, pursuant to which we will both be able to equally access JTX-4014 for combinations within our portfolios and with other molecules that are subject to the agreement, subject to joint governance. Once Celgene opts in with respect to a given program, Celgene and we must each use commercially reasonable efforts to develop and commercialize the corresponding product in the United States.

Governance: The collaboration is governed by a joint steering committee, or JSC, and a joint patent committee. The JSC may establish additional subcommittees to oversee particular projects or activities. Subject to limitations specified in the agreement, if the applicable governance committee is unable to make a decision by consensus and the parties are unable to resolve the issue through escalation to specified senior executive officers of the parties, then we generally have final decision-making authority over research and development matters for programs prior to Celgene's exercise of its option to such program. If Celgene exercises its option for a program, final decision-making authority for that program is specified in the applicable co-development and co-commercialization agreement or license agreement.

Exclusivity: During the collaboration's research term (i.e., for four years plus up to three one-year extensions that Celgene may elect), we may not alone, or with a third party, research, develop, manufacture or commercialize a biologic that binds to a defined pool of B cell, T regulatory cell or tumor-associated macrophage targets that meet certain criteria, termed an exclusive target, and inhibit, activate or otherwise modulate the activity of such exclusive target. In addition, if Celgene exercises its option for a program within the collaboration other than JTX-4014, then until termination or expiration of the applicable co-development and co-commercialization agreement for such program, we may not directly or indirectly research, develop, manufacture or commercialize, outside of the collaboration, any biologic with specified activity against that program's collaboration target.

Financial terms: Under the terms of the agreements, we received a $225.0 million upfront cash payment and $36.1 million from the sale of 10,448,100 shares of our Series B-1 convertible preferred stock to Celgene, which shares

converted into 2,831,463 shares of common stock upon the closing of our initial public offering. If Celgene exercises any of its options, then Celgene will pay us an option-exercise fee, the parties will enter into a co-development and co-commercialization agreement or a license agreement that governs the development and commercialization of the applicable program, and we will then split future development and commercialization costs with Celgene in accordance with such agreement. Additionally, under the terms of the agreement, if Celgene exercises all of its options, all programs meet all milestones, including regulatory approvals in the United States and outside the United States, and Celgene extends the initial four-year research term for three additional years, we are eligible to earn up to approximately $2.6 billion in clinical, regulatory, and/or commercialization milestone payments, option-exercise fees and research term extension fees.

The development milestones are payable on initiation of certain clinical trials and range from $32.5 million to $105.0 million, per program, with an aggregate total of $290.0 million. The regulatory approval milestones are payable upon regulatory approval in the United States and outside the United States and range from $7.5 million to $50.0 million per milestone, with an aggregate total of $700.0 million. The commercial milestones are payable upon achievement of specified aggregate product sales outside the United States for each program and range from $40.0 million to $200.0 million per milestone, with an aggregate total of $1.270 billion. We are also eligible to receive royalties on product sales outside the United States ranging from high single digit to mid-teen royalties. As of December 31, 2018, we had not received any option exercise, research term extension, milestone or royalty payments under the Celgene Collaboration Agreement.

Profit sharing, cost sharing and commercialization rights for products: If Celgene exercises its option for a program, then we will share with Celgene the U.S. profits or losses on such collaboration program as follows:

- We will retain 60 percent of the U.S. operating profits or losses arising from commercialization of vopratelimab, with 40 percent allocated to Celgene.
- We will retain 25 percent of the U.S. operating profits or losses arising from commercialization of the first program, other than vopratelimab or JTX-4014, for which an IND application is filed under the collaboration, with 75 percent allocated to Celgene. Celgene has a one-time right to substitute and swap the economics and governance of this program with that of another program for which it exercises an option (other than vopratelimab and JTX-4014).
- We and Celgene will equally share U.S. operating profits or losses arising from commercialization of up to three additional programs (other than vopratelimab or JTX-4014).
- We and Celgene will share all development costs, other than for JTX-4014, in accordance with the applicable co-development and co-commercialization agreement.

If Celgene exercises its option for a program other than JTX-4014, we will enter into a co-development and co-commercialization agreement, pursuant to which Celgene will have the exclusive right to develop and commercialize the products arising out of such collaboration program outside of the United States, and we will be eligible to receive tiered royalties ranging from a high single digit to mid-teen percentage rate on net product sales outside of the United States. Under each co-development and co-commercialization agreement, we will also have the right to opt out of profit sharing in the United States and instead receive milestones and royalties.

Furthermore, if Celgene exercises its option for JTX-4014, we will enter into a license agreement, pursuant to which Celgene and we will each have equal rights to develop and commercialize JTX-4014 in combination with other proprietary molecules in their or our respective pipelines or in combination with products arising out of collaboration programs. Subject to terms specified in the license agreement for JTX-4014, the party owning the proprietary molecule that is combined with JTX-4014, if such molecule does not arise from a collaboration program with Celgene, will be solely responsible for all development and commercialization costs related to such combination. If JTX-4014 is combined with a product arising from a collaboration program, then the parties will share costs and, if co-packaged or co-formulated, profits or losses in accordance with the co-development and co-commercialization agreement for such other product.

Intellectual Property: We and Celgene will jointly own any intellectual property that is generated or invented by both parties pursuant to the activities conducted under the collaboration agreement. If Celgene exercises its option for a program, each party will also grant the other party exclusive or co-exclusive licenses, with rights to grant sublicenses, under certain of each party's intellectual property rights, determined by the nature of the program and the licensed territory.

Termination: At any point during the collaboration agreement, including during the research, development and clinical trial process, or during the term of the applicable co-development and co-commercialization or license agreement, respectively, Celgene can terminate the applicable agreement with us in its entirety, or with respect to any program under the collaboration agreement, upon 120 days' notice and can terminate the entire agreement with us in connection with a material breach of the agreement by us that remains uncured for 90 days.

In January 2019, Celgene and BMS announced that they had entered into an agreement under which Celgene will be acquired by BMS, subject to shareholder and regulatory approvals.

Manufacturing

We rely on and will continue to rely on our contract manufacturing organizations, or CMOs, for both drug substance and drug product. While we do not plan to develop our own full-scale manufacturing capabilities, we may consider establishing a small, flexible approach for supporting preclinical IND-enabling studies and early clinical trials. As of now, all of our manufacturing is outsourced to well-established third-party manufacturers. We have entered into long-term contracts with CMOs for drug supply to our vopratelimab, JTX-4014 and JTX-8064 preclinical studies and clinical trials.

Competition

The biotechnology and pharmaceutical industries, and the immunotherapy subsector, are characterized by rapid evolution of technologies, fierce competition and strong defense of intellectual property. While we believe that our product candidates, discovery programs, technology, knowledge, experience, and scientific resources provide us with competitive advantages, we face competition from major pharmaceutical and biotechnology companies, academic institutions, governmental agencies and public and private research institutions, among others.

Any product candidates that we successfully develop and commercialize will compete with currently approved therapies and new therapies that may become available in the future. Key product features that would affect our ability to effectively compete with other therapeutics include the efficacy, safety and convenience of our products and the ease of use and effectiveness of any complementary diagnostics and/or companion diagnostics. Potentially competitive therapies fall primarily into the following groups of treatment:

- traditional cancer therapies, including chemotherapy;
- four clinical-stage anti-ICOS antibody programs in clinical trials, being developed by BMS, GlaxoSmithKline plc and Kymab Group Ltd.;
- a bispecific anti-ICOS and anti-PD-1 antibody program in clinical development being developed by Xencor, Inc.;
- approved immunotherapy antibodies, including an approved anti-CTLA 4 antibody (Yervoy, marketed by BMS) and approved anti-PD-1/anti-PD-L1 antibodies (Bavencio, Keytruda, Libtayo, Opdivo, Tecentriq, and Imfizi, marketed by Merck KGaA and Pfizer, Inc., Merck & Co., Regeneron Pharmaceuticals, Inc., BMS, Genentech, Inc. and AstraZeneca PLC, respectively);
- an anti-LILRB2 (also known as ILT4) program in clinical development being developed by Merck & Co., Inc.;
- anti-PD-1/anti-PD-L1 immunotherapy antibodies in clinical development;
- other agonist immunotherapy antibodies in clinical development; and
- therapies targeting T regulatory cells and B cells that are in clinical development.

The availability of reimbursement from government and other third-party payors will also significantly affect the pricing and competitiveness of our products. In addition, our competitors may obtain Food and Drug Administration, or FDA, or other 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 are able to enter the market.

Many of the companies against which we may compete, either alone or with their strategic partners, have significantly greater financial resources and expertise in research and development, manufacturing, preclinical testing, conducting clinical trials, obtaining regulatory approvals and marketing approved products than we do. These competitors also compete with us in recruiting and retaining qualified scientific and management personnel and establishing clinical trial sites and patient registration for clinical trials, as well as in acquiring technologies complementary to, or necessary for, our programs.

Intellectual Property

Our intellectual property is critical to our business and we strive to protect it, including by obtaining and maintaining patent protection in the United States and internationally for our product candidates, novel biological discoveries, including new targets and applications, and other inventions that are important to our business. For our product candidates, generally we intend to first pursue patent protection covering both compositions of matter and methods of use. As we continue the development of our product candidates, we intend to identify additional means of obtaining patent protection that would potentially enhance commercial success, including through additional methods of use and biomarker and complementary diagnostic and/or companion diagnostic related claims.

The patent positions of biotechnology companies like ours are generally uncertain and involve complex legal, scientific and factual questions. In addition, the coverage claimed in a patent application can be significantly reduced before the patent is issued, and its scope can be reinterpreted after issuance. Consequently, we may not obtain or maintain adequate patent protection for any of our product candidates. As of March 1, 2019, with respect to vopratelimab patent rights, we own six pending U.S. provisional patent applications, two pending U.S. non-provisional application, thirty-six pending foreign patent applications, and one pending Patent Cooperation Treaty, or PCT, patent application within five patent families that cover compositions of matter and methods of use and ICOS-related biomarkers, and we own one issued U.S. patent that covers compositions of matter and methods of use. As of March 1, 2019, with respect to JTX-4014 patent rights, we own one pending U.S. non-provisional application, three pending foreign patent applications, and one pending PCT patent application within one patent family that covers compositions of matter and methods of use, and we do not own any issued patents. As of March 1, 2019, with respect to JTX-8064 patent rights, we own one pending U.S. non-provisional application, three pending foreign patent applications, and one pending PCT patent application within one patent family that covers compositions of matter and methods of use, and we do not own any issued patents. We cannot predict whether the patent applications we pursue will issue as patents in any particular jurisdiction or whether the claims of any issued patents will provide any proprietary protection from competitors. Even if our pending patent applications are granted as issued patents, those patents, as well as any patents we license from third parties, may be challenged, circumvented or invalidated by third parties.

In addition, we exclusively in-licensed a patent portfolio from Sloan Kettering Institute for Cancer Research, Memorial Sloan Kettering Cancer Center and Memorial Hospital for Cancer, or MSK, and University of Texas MD Anderson Cancer Center, or MD Anderson, consisting of four issued U.S. patents, one issued Australian patent, one issued Japanese patent, one issued Canadian patent, two issued Chinese patents, one issued European patent that has been validated in thirteen European jurisdictions, one pending U.S. patent application, and two pending foreign patent applications. This licensed patent portfolio covers methods related to the use of an ICOS agonist in combination with blocking agents of certain T cell inhibitory receptors. The issued patents and the pending patent applications (if issued) licensed from MSK and MD Anderson, if the appropriate maintenance, renewal, annuity or other governmental fees are paid, are expected to expire in 2030, excluding any additional term for patent term adjustments or patent term extensions.

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

We also rely on unpatented know-how, inventions and other proprietary information relating to vopratelimab, JTX-4014, JTX-8064 and our other future product candidates. We seek to protect and maintain the confidentiality of proprietary information to protect aspects of our business that are not amenable to, or that we do not consider appropriate for, patent protection. Although we take steps to protect our proprietary information and trade secrets, including through contractual means with our employees and consultants, third parties may independently develop substantially equivalent proprietary information and techniques or otherwise gain access to our trade secrets or disclose our

technology. Thus, we may not be able to meaningfully protect our trade secrets. It is our policy to require our employees, consultants, outside scientific collaborators, sponsored researchers and other advisors to execute confidentiality agreements upon the commencement of employment or consulting relationships with us. These agreements provide that all confidential information concerning our business or financial affairs developed or made known to the individual during the course of the individual's relationship with us is to be kept confidential and not disclosed to third parties except in specific circumstances. Our agreements with employees also provide that all inventions conceived by the employee in the course of employment with us or from the employee's use of our confidential information are our exclusive property. However, such confidentiality agreements and invention assignment agreements can be breached, and we may not have adequate remedies for any such breach. For a more comprehensive discussion of the risks related to our intellectual property, please see "Risk Factors—Risks Related to Intellectual Property."

Exclusive License Agreement with Sloan Kettering Institute for Cancer Research, Memorial Sloan Kettering Cancer Center, and Memorial Hospital for Cancer and Allied Diseases

In September 2015, we amended and restated an exclusive license agreement from December 2013 with Sloan Kettering Institute for Cancer Research, MSK and Memorial Hospital for Cancer and Allied Diseases. Pursuant to this amended and restated license agreement, MSK and MD Anderson granted to us a worldwide exclusive license under certain patents to manufacture, develop and commercialize certain products and services, including those products for which the use in combination with another product for the treatment of any disease is covered by such patents (including, potentially, vopratelimab), and to practice certain methods covered by the patents.

Under the license agreement, we are obligated to use commercially reasonable efforts to commercialize at least one licensed product or licensed service as defined in the license agreement. We also are required to achieve the following developmental milestones by the end of 2019: achievement of initial efficacy of proof of concept, identification of a development candidate, and filing of an IND application with the FDA. As of September 30, 2016, we have achieved all of these milestones.

In connection with the license agreement, we issued to MSK and MD Anderson an aggregate of 60,974 shares of our common stock. We also paid an upfront license fee of $30,000 to MSK and MD Anderson. Commencing on the third anniversary of the effective date of the license agreement, we must pay an annual maintenance fee ranging in the mid-four figures to the mid-five figures. The annual maintenance fee is fully credited against the royalty payments for the same year or any subsequent year or any other amount due under the license agreement. We are obligated to pay MSK milestone payments of up to $3,475,000 for the first and second licensed products to achieve certain development and marketing approval milestones, including up to $2,725,000 for the first licensed product to achieve such developmental and marketing approval milestones. On a country-by-country basis and licensed product-by-licensed product or licensed service-by-licensed service basis, we are also obligated to pay MSK a low single-digit percentage royalty on net sales of licensed products or licensed services, to the extent used in combination with another product for the treatment of any disease covered by the applicable patents, until the earlier of the expiration of the last valid patent claim covering such licensed product or licensed service in such country or twelve years after the first commercial sale of such licensed product or licensed service in such country. If we sublicense our rights under our license agreement with MSK, we would be obligated to pay MSK a low double-digit percentage royalty of the total gross proceeds we receive in consideration of the grant of the sublicense, excluding royalties, research and development funding, payments for equity or debt securities and certain other expenses we have incurred that are reimbursed by the sublicensee.

Unless terminated earlier, the license agreement expires on the date that we no longer have any royalty payment obligations under the license agreement. We may terminate the license agreement for convenience in its entirety upon 30 days' prior written notice to MSK and MD Anderson. Either party may terminate the license agreement in its entirety in the event of an uncured material breach or the bankruptcy, insolvency, dissolution or winding up of the other party which is not dismissed or cured within a set period of time. If we terminate the license agreement because of MSK's and MD Anderson's uncured breach or insolvency, we will retain a non-exclusive, perpetual, irrevocable, fully paid-up, royalty-free worldwide license to the licensed patents. Upon expiration of our obligation to pay royalties for a licensed product or service in a country, our license to the licensed patents for such licensed product or service will become exclusive, perpetual, irrevocable, fully paid-up and royalty-free in such country.

Government Regulation

Government authorities in the United States at the federal, state and local level and in other countries regulate, among other things, the research, development, testing, manufacture, quality control, approval, labeling, packaging, storage, record-keeping, promotion, advertising, sales, pricing, reimbursement, distribution, post-approval monitoring and reporting, marketing and export and import of drug and biological products, such as vopratelimab, JTX-4014, JTX-8064 and other future product candidates. Generally, before a new drug or biologic can be marketed, considerable data demonstrating its quality, safety and efficacy must be obtained, organized into a format specific for each regulatory authority, submitted for review and approved by the regulatory authority.

U.S. Drug Development

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

Vopratelimab, JTX-4014, JTX-8064 and other future product candidates must be approved by the FDA through either a New Drug Application, or NDA, or Biologics License Application, or BLA, process before they may be legally marketed in the United States. We expect vopratelimab, JTX-4014, JTX-8064 and other future product candidates to be regulated by the FDA as biologics and require the submission of a BLA prior be being marketed in the United States. The process generally involves the following:

- completion of extensive preclinical studies in accordance with applicable regulations, including studies conducted in accordance with good laboratory practice, or GLP, requirements;
- submission to the FDA of an IND application, which must become effective before human clinical trials may begin;
- approval by an independent institutional review board, or IRB, or ethics committee at each clinical trial site before each trial may be initiated;
- performance of adequate and well-controlled human clinical trials in accordance with applicable IND regulations, good clinical practice, or GCP, requirements and other clinical trial-related regulations to establish the safety and efficacy of the investigational product for each proposed indication;
- submission to the FDA of an NDA or BLA;
- determination by the FDA within 60 days of its receipt of an NDA or BLA to accept the filing for review;
- satisfactory completion of an FDA pre-approval inspection of the manufacturing facility or facilities where the drug or biologic will be produced to assess compliance with current good manufacturing practices, or cGMP, requirements to assure that the facilities, methods and controls are adequate to preserve the drug or biologic's identity, strength, quality and purity;
- potential FDA audit of the preclinical and/or clinical trial sites that generated the data in support of the NDA or BLA;
- FDA review and approval of the NDA or BLA, including consideration of the views of any FDA advisory committee, prior to any commercial marketing or sale of the drug or biologic in the United States; and
- compliance with any post-approval requirements, including the potential requirement to implement a Risk Evaluation and Mitigation Strategy, or REMS, and the potential requirement to conduct post-approval studies.

Preclinical Studies and IND

The preclinical developmental stage generally involves laboratory evaluations of product chemistry, formulation and stability, as well as *in vitro* and animal studies to evaluate toxicity, assess the potential for adverse events and, in some cases, establish a rationale for therapeutic use. The conduct of preclinical studies is subject to federal regulations and requirements, including GLP regulations for safety/toxicology studies. An IND sponsor must submit the results of the preclinical tests, together with manufacturing information, analytical data, any available clinical data or literature and plans for clinical trials, among other things, to the FDA as part of an IND. An IND is an exemption from the FDCA that allows an unapproved product candidate to be shipped in interstate commerce for use in an investigational clinical trial and a request for FDA authorization to administer such investigational product to humans. Some long-term preclinical testing, such as animal tests of reproductive adverse events and carcinogenicity, may continue after the IND is submitted. An IND automatically becomes effective 30 days after receipt by the FDA, unless before that time, the FDA raises concerns or questions related to one or more proposed clinical trials and places the trial on clinical hold. In such a case, the IND sponsor and the FDA must resolve any outstanding concerns before the clinical trial can begin. As a result, submission of an IND may not result in the FDA allowing clinical trials to commence.

Following commencement of a clinical trial under an IND, the FDA may also place a clinical hold or partial clinical hold on that trial. Clinical holds are imposed by the FDA whenever there is concern for patient safety and may be a result of new data, findings, or developments in clinical, non-clinical, and/or chemistry, manufacturing, and controls. A clinical hold is an order issued by the FDA to the sponsor to delay a proposed clinical investigation or to suspend an ongoing investigation. A partial clinical hold is a delay or suspension of only part of the clinical work requested under the IND. For example, a specific protocol or part of a protocol is not allowed to proceed, while other protocols may do so. Following issuance of a clinical hold or partial clinical hold, an investigation may only resume after the FDA has notified the sponsor that the investigation may proceed. The FDA will base that determination on information provided by the sponsor correcting the deficiencies previously cited or otherwise satisfying the FDA that the investigation can proceed.

Clinical Trials

The clinical stage of development involves the administration of the investigational product to healthy volunteers or patients under the supervision of qualified investigators in accordance with GCP requirements, including the requirement that all research subjects provide their informed consent. Clinical trials are conducted under protocols detailing, among other things, the objectives of the clinical trial, dosing procedures, subject selection and exclusion criteria and the parameters to be used to monitor subject safety and assess efficacy. Each protocol, and any subsequent amendments to the protocol, must be submitted to the FDA as part of the IND. Furthermore, an IRB for each institution at which the clinical trial will be conducted must review and approve the protocol before a clinical trial commences at such institution, approve the information regarding the trial and the consent form that must be provided to each clinical trial subject or his or her legal representative and must monitor the clinical trial until completed. Additionally, some trials are overseen by an independent group of qualified experts organized by the trial sponsor, known as a data safety monitoring board or committee, or DSMB. This group provides authorization as to whether or not a trial may move forward at designated check points based on available data from the study. There also are requirements governing the reporting of ongoing clinical trials and completed clinical trial results to public registries.

Clinical trials generally are conducted in three sequential phases, known as Phase 1, Phase 2 and Phase 3, which may overlap.

- Phase 1 clinical trials generally involve a small number of healthy volunteers or disease-affected patients who are initially exposed to a single dose and then multiple doses of the product candidate. The primary purpose of these clinical trials is to assess the metabolism, pharmacologic action, side effect tolerability and safety of the drug.
- Phase 2 clinical trials involve studies in disease-affected patients to determine the dose required to produce the desired benefits. At the same time, safety and further pharmacokinetic and pharmacodynamic information is collected, possible adverse effects and safety risks are identified and a preliminary evaluation of efficacy is conducted.
- Phase 3 clinical trials generally involve a large number of patients at multiple sites and are designed to provide the data necessary to demonstrate the effectiveness of the product for its intended use, its safety in use and to establish the overall benefit/risk relationship of the product and provide an adequate basis for product approval. These trials may include comparisons with placebo and/or other comparator treatments. The duration of treatment is often extended to mimic the actual use of a product during marketing.

Post-approval trials, sometimes referred to as Phase 4 clinical trials, may be conducted after initial marketing approval. These trials are used to gain additional experience from the treatment of patients in the intended therapeutic indication.

Progress reports detailing the results of the clinical trials must be submitted at least annually to the FDA and written IND safety reports must be submitted to the FDA and the investigators for serious and unexpected suspected adverse events, findings from animal or *in vitro* testing or other studies that suggest a significant risk for human subjects and any clinically important increase in the rate of a serious suspected adverse reaction over that listed in the protocol or investigator brochure.

Clinical trials may not be completed successfully within any specified period, if at all. The FDA or the sponsor may suspend or terminate a clinical trial at any time on various grounds, including a finding that the research subjects or patients are being exposed to an unacceptable health risk. Similarly, an IRB can suspend or terminate approval of a clinical trial at its institution if the clinical trial is not being conducted in accordance with the IRB's requirements or if the drug or biologic has been associated with unexpected serious harm to patients. Results from one trial are not necessarily predictive of results from later trials. Concurrent with clinical trials, companies usually complete additional animal studies and must develop additional information about the chemistry and physical characteristics of the drug or biologic as well as finalize a process for manufacturing the product in commercial quantities in accordance with cGMP requirements. The manufacturing process must be capable of consistently producing quality batches of the product and, among other things, companies must develop methods for testing the identity, strength, quality and purity of the final product. Additionally, appropriate packaging must be selected and tested, and stability studies must be conducted to demonstrate that vopratelimab, JTX-4014, JTX-8064 and other future product candidates do not undergo unacceptable deterioration over their shelf life.

Information about clinical trials must be submitted within specific time frames to the National Institutes of Health, or NIH, for public dissemination on its ClinicalTrials.gov website.

Expanded Access to an Investigational Drug for Treatment Use

Expanded access, sometimes called "compassionate use," is the use of investigational new drug products outside of clinical trials to treat patients with serious or immediately life-threatening diseases or conditions when there are no comparable or satisfactory alternative treatment options. The rules and regulations related to expanded access are intended to improve access to investigational drugs for patients who may benefit from investigational therapies. FDA regulations allow access to investigational drugs under an IND by the company or the treating physician for treatment purposes on a case-by-case basis for: individual patients (single-patient IND applications for treatment in emergency settings and non-emergency settings); intermediate-size patient populations; and larger populations for use of the drug under a treatment protocol or Treatment IND Application.

On December 13, 2016, the 21st Century Cures Act established (and the 2017 Food and Drug Administration Reauthorization Act later amended) a requirement that sponsors of one or more investigational drugs for the treatment of a serious disease(s) or condition(s) make publicly available their policy for evaluating and responding to requests for expanded access for individual patients. Although these requirements were rolled out over time, they have now come into full effect. This provision requires drug and biologic companies to make publicly available their policies for expanded access for individual patient access to products intended for serious diseases. Sponsors are required to make such policies publicly available upon the earlier of initiation of a Phase 2 or Phase 3 study; or 15 days after the drug or biologic receives designation as a breakthrough therapy, fast track product, or regenerative medicine advanced therapy.

In addition, on May 30, 2018, the Right to Try Act, was signed into law. The law, among other things, provides a federal framework for certain patients to access certain investigational new drug products that have completed a Phase I clinical trial and that are undergoing investigation for FDA approval. Under certain circumstances, eligible patients can seek treatment without enrolling in clinical trials and without obtaining FDA permission under the FDA expanded access program. There is no obligation for a drug manufacturer to make its drug products available to eligible patients as a result of the Right to Try Act, but the manufacturer must develop an internal policy and respond to patient requests according to that policy.

NDA/BLA and FDA Review Process

The results of preclinical studies and clinical trials, together with other detailed information, including proposed labeling, chemistry and manufacturing information, are submitted to the FDA as part of an NDA or BLA. The NDA or BLA is a request for approval to market the drug or biologic for one or more specified indications and must contain proof of safety and efficacy for a drug or safety, purity and potency for a biologic. The FDA must approve the NDA or BLA before a drug or biologic may be marketed in the United States.

Under the Prescription Drug User Fee Act, or PDUFA, as amended, each NDA or BLA must be accompanied by a user fee. Under federal law, the submission of most NDAs and BLAs is subject to a substantial application user fee, currently $2,588,478 for an application requiring clinical data for fiscal year 2019, and the sponsor of an approved NDA or BLA is also subject to an annual product or program fees, currently $309,915 per program. These fees may be increased or decreased annually, and fee waivers, reductions or deferrals are available in certain circumstances.

The FDA reviews each NDA and BLA for administrative completeness and reviewability within 60 days following receipt by the FDA of the NDA or BLA. If the submission is found to be complete, the FDA will file the NDA or BLA, triggering a full review. The FDA may refuse to file any NDA or BLA that it deems incomplete or not properly reviewable at the time of submission. The established goal of the FDA is to review applications within ten months of the filing date for a new molecular-entity NDA or original BLA and within six months from the filing date for a new molecular-entity NDA or original BLA designated for priority review. The FDA does not always meet its goal dates for standard and priority NDAs or BLAs, and the review process is often extended by FDA requests for additional information or clarification.

Before approving an NDA or BLA, the FDA may inspect the manufacturing facilities for the new product and will not approve the product unless the facilities comply with cGMP requirements. The FDA may refer applications for novel drug products or drug products which 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 and under what conditions, if any. The FDA is not bound by recommendations of an advisory committee, but it considers such recommendations when making decisions on approval. Additionally, the FDA may audit data from clinical trials to ensure compliance with GCP requirements and likely will reanalyze the clinical trial data, which could result in extensive discussions between the FDA and the applicant during the review process. After the FDA evaluates an NDA or BLA, it will issue an approval letter or a Complete Response Letter. An approval letter authorizes commercial marketing of the drug with specific prescribing information for specific indications. A Complete Response Letter describes additional work that must be done before the application can be approved, such as requiring additional clinical data, additional pivotal Phase 3 clinical trial(s) and/or other significant and time-consuming requirements related to clinical trials, preclinical studies or manufacturing. Even if such data and information are submitted, the FDA may decide that the NDA or BLA does not satisfy the criteria for approval. Data obtained from clinical trials are not always conclusive and the FDA may interpret data differently than we interpret the same data.

Orphan Drug Designation

Under the Orphan Drug Act, the FDA may grant orphan designation to a drug or biological product intended to treat a rare disease or condition, which is generally a disease or condition that affects fewer than 200,000 individuals in the United States, or more than 200,000 individuals in the United States and for which there is no reasonable expectation that the cost of developing and making the product available in the United States for this type of disease or condition will be recovered from sales of the product.

Orphan drug designation must be requested before submitting an NDA or BLA. After the FDA grants orphan drug designation, the identity of the therapeutic agent and its potential orphan use are disclosed publicly by the FDA. Orphan drug designation does not convey any advantage in or shorten the duration of the regulatory review and approval process. These circumstances are where another product shows clinical superiority to the product with orphan drug exclusivity because it is shown to be safer, more effective or makes a major contribution to patient care. This is the case despite an earlier court opinion holding that the Orphan Drug Act unambiguously required the FDA to recognize orphan exclusivity regardless of a showing of clinical superiority.

If a product that has orphan designation subsequently receives the first FDA approval for the disease or condition for which it has such designation, the product is entitled to orphan drug exclusivity, which means that the FDA may not approve any other applications to market the same drug for the same indication for seven years from the date of such approval, except in limited circumstances.

Competitors may also receive approval of either a different product for the same indication or the same product for a different indication but that could be used off-label in the orphan indication. Orphan drug exclusivity also could block the approval of one of our products if a competitor obtains approval before we do for the same product, as defined by the FDA, for the same indication we are seeking approval, or if one of our products is determined to be contained within the scope of the competitor's product for the same indication or disease. If one of our products designated as an orphan drug receives marketing approval for an indication broader than that which is designated, it may not be entitled to orphan drug exclusivity. Orphan drug status in the European Union has similar, but not identical, requirements and benefits.

Expedited Development and Review Programs

The FDA has various programs, including a fast track program, priority review and accelerated approval, that are intended to expedite or facilitate the process for reviewing new drugs and biologics that, generally, are intended to treat a serious or life-threatening condition, demonstrate the potential to address unmet medical needs and that offer meaningful benefits over existing treatments. The fast track program is designed to facilitate the development and review of drugs to treat serious or life-threatening diseases or conditions and fulfill unmet needs. Priority review is designed to give drugs that offer major advances in treatment or provide treatment where no adequate therapy exists. The FDA will attempt to direct additional resources to the evaluation of an application for a new drug or biologic designated for priority review in an effort to facilitate the review.

A candidate product may also be eligible for accelerated approval if it treats a serious or life-threatening condition and generally provides a meaningful advantage over available therapies. In addition, the investigational product must demonstrate 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, or IMM, which is reasonably likely to predict an effect on IMM or other clinical benefit. As a condition of approval, the FDA may require that a sponsor of a drug or biologic receiving accelerated approval perform adequate and well-controlled post-marketing clinical trials.

Additionally, a drug or biologic may be eligible for designation as a breakthrough therapy if the product is intended, alone or in combination with one or more other drugs or biologics, to treat a serious or life-threatening condition and preliminary clinical evidence indicates that the product may demonstrate substantial improvement over currently approved therapies on one or more clinically significant endpoints. The benefits of breakthrough therapy designation include the same benefits as fast track designation, plus intensive guidance from the FDA to ensure an efficient drug development program. Fast track designation, priority review, accelerated approval and breakthrough therapy designation do not change the standards for approval, but may expedite the development or approval process.

Pediatric Information

Under the Pediatric Research Equity Act, an NDA or BLA or supplement to an NDA or BLA must contain data to assess the safety and efficacy of the drug for the claimed indications in all relevant pediatric subpopulations and to support dosing and administration for each pediatric subpopulation for which the product is safe and effective. The assessment must also support dosing and administration for each pediatric subpopulation for which the product is safe and effective. The Food and Drug Administration Safety and Innovation Act, or FDASIA, requires the submission of a pediatric study plan prior to the assessment of data, which must contain proposed pediatric study, including study design and objectives, any deferral or waiver requests, and any other information required by regulation. The FDA may grant deferrals for submission of pediatric data until after the approval of the drug for use in adults or full or partial waivers from the pediatric data requirements. Additional requirements and procedures relating to deferral requests and requests for extensions of deferrals are contained in FDASIA.

Post-marketing Requirements

Following approval of a new product, the manufacturer and the approved product are subject to continuing regulation by the FDA, including, among other things, monitoring and record-keeping activities, reporting of adverse experiences, complying with promotion and advertising requirements, which include restrictions on promoting drugs for unapproved uses or patient populations (known as “off-label use”) and limitations on industry-sponsored scientific and educational activities.

The FDA strictly regulates marketing, labeling, advertising and promotion of products that are placed on the market. The FDA and other agencies actively enforce the laws and regulations prohibiting the promotion of off label uses, and a company that is found to have improperly promoted off label uses may be subject to significant liability. If a company is found to have promoted off-label uses, it may become subject to adverse public relations and administrative and judicial enforcement by the FDA, the Department of Justice, or the Office of the Inspector General of the Department of Health and Human Services, as well as state authorities.

The FDA may also place other conditions on approvals, including imposing limitations on the uses for which the product may be marketed, requiring that warning statements be included in the product labeling, requiring that additional studies be conducted following approval as a condition of the approval, imposing restrictions and conditions on product distribution, prescribing or dispensing in the form of a Risk Evaluation and Mitigation Strategy, or REMS, or otherwise limiting the scope of any approval. Product approvals may be withdrawn for non-compliance with regulatory requirements or if problems occur following initial marketing.

FDA regulations require that products be manufactured in specific approved facilities and in accordance with cGMP regulations. We rely, and expect to continue to rely, on third parties for the production of clinical and commercial quantities of our products in accordance with cGMP regulations. These manufacturers must comply with cGMP regulations that require, among other things, quality control and quality assurance, the maintenance of records and documentation and the obligation to investigate and correct any deviations from cGMP. Manufacturers and other entities involved in the manufacture and distribution of approved drugs or biologics are required to register their establishments with the FDA and certain state agencies. The discovery of violative conditions, including failure to conform to cGMP regulations, could result in enforcement actions, and the discovery of problems with a product after approval may result in restrictions on a product, manufacturer or holder of an approved NDA or BLA, including recall.

Companion Diagnostics and Complementary Diagnostics

We believe that the success of our product candidates may depend, in part, on the development and commercialization of either a companion diagnostic or complementary diagnostic. Companion diagnostics and complementary diagnostics can identify patients who are most likely to benefit from a particular therapeutic product, identify patients likely to be at increased risk for serious side effects as a result of treatment with a particular therapeutic product, or monitor response to treatment with a particular therapeutic product for the purpose of adjusting treatment to achieve improved safety or effectiveness. Companion diagnostics and complementary diagnostics are regulated as medical devices by the FDA and, as such, require either clearance or approval prior to commercialization. The level of risk combined with available controls to mitigate risk determines whether a companion diagnostic device requires Premarket Approval Application approval or is cleared through the 510(k) premarket notification process. Under FDA guidance, for a novel therapeutic product for which a companion diagnostic device is essential for the safe and effective use of the product, the companion diagnostic device should be developed and approved or 510(k)-cleared contemporaneously with the therapeutic. The use of the companion diagnostic device will be stipulated in the labeling of the therapeutic product. This is also true for a complementary diagnostic, although it is not a prerequisite for receiving the therapeutic.

If safe and effective use of a therapeutic depends on an *in vitro* diagnostic, then the FDA generally will require approval or clearance of that diagnostic, known as a companion diagnostic, at the same time that the FDA approves the therapeutic product. In August 2014, the FDA issued final guidance clarifying the requirements that will apply to approval of therapeutic products and *in vitro* companion diagnostics. According to the guidance, if FDA determines that a companion diagnostic device is essential to the safe and effective use of a novel therapeutic product or indication, FDA generally will not approve the therapeutic product or new therapeutic product indication if the companion diagnostic device is not approved or cleared for that indication. Approval or clearance of the companion diagnostic device will ensure that the device has been adequately evaluated and has adequate performance characteristics in the intended population. The review of *in vitro* companion diagnostics in conjunction with the review of our therapeutic treatments for cancer will, therefore, likely involve coordination of review by the FDA's Center for Drug Evaluation and Research and the FDA's Center for Devices and Radiological Health Office of In Vitro Diagnostics Device Evaluation and Safety.

Other Regulatory Matters

Manufacturing, sales, promotion and other activities following product approval are also subject to regulation by numerous regulatory authorities in the United States in addition to the FDA, including the Centers for Medicare & Medicaid Services, other divisions of the Department of Health and Human Services, the Department of Justice, the Drug Enforcement Administration, the Consumer Product Safety Commission, the Federal Trade Commission, the Occupational Safety & Health Administration, the Environmental Protection Agency and state and local governments.

For example, in the United States, sales, marketing and scientific and educational programs also must comply with state and federal fraud and abuse laws. These laws include the federal Anti-Kickback Statute, which makes it illegal for any person, including a prescription drug manufacturer (or a party acting on its behalf), to knowingly and willfully solicit, receive, offer or pay any remuneration that is intended to induce or reward referrals, including the purchase, recommendation, order or prescription of a particular drug, for which payment may be made under a federal healthcare program, such as Medicare or Medicaid.

Although we would not submit claims directly to payors, manufacturers also can be held liable under the federal False Claims Act, which prohibits anyone from knowingly presenting, or causing to be presented, for payment to federal programs (including Medicare and Medicaid) claims for items or services, including drugs or biologics, that are false or fraudulent, claims for items or services not provided as claimed or claims for medically unnecessary items or services. In addition, our future activities relating to the reporting of wholesaler or estimated retail prices for our products, the reporting of prices used to calculate Medicaid rebate information and other information affecting federal, state and third-party reimbursement for our products, and the sale and marketing of our products, are subject to scrutiny under this law.

Pricing and rebate programs must comply with the Medicaid rebate requirements of the U.S. Omnibus Budget Reconciliation Act of 1990 and more recent requirements in the Affordable Care Act. The distribution of pharmaceutical products is subject to additional requirements and regulations, including extensive record-keeping, licensing, storage and security requirements intended to prevent the unauthorized sale of pharmaceutical products.

The failure to comply with any of these laws or regulatory requirements subjects us to possible legal or regulatory action. Depending on the circumstances, failure to meet applicable regulatory requirements can result in criminal prosecution, fines or other penalties, injunctions, requests for recall, seizure of products, total or partial suspension of production, denial or withdrawal of product approvals or refusal to allow a firm to enter into supply contracts, including government contracts. Any action against us for violation of these laws, even if we successfully defend against it, could cause us to incur significant legal expenses and divert our management's attention from the operation of our business. Prohibitions or restrictions on sales or withdrawal of future products marketed by us could materially affect our business in an adverse way.

Changes in regulations, statutes or the interpretation of existing regulations could impact our business in the future by requiring, for example: (i) changes to our manufacturing arrangements; (ii) additions or modifications to product labeling; (iii) the recall or discontinuation of our products; or (iv) additional record-keeping requirements. If any such changes were to be imposed, they could adversely affect the operation of our business.

U.S. Patent Term Restoration and Non-Patent Exclusivity

Depending upon the timing, duration and specifics of FDA approval of vopratelimab, JTX-4014, JTX-8064 and other future product candidates, some of our U.S. patents may be eligible for limited patent term extension under the Drug Price Competition and Patent Term Restoration Act of 1984, commonly referred to as the Hatch-Waxman Amendments. The Hatch-Waxman Amendments permit restoration of the patent term of up to five years as compensation for patent term lost during product development and FDA regulatory review process. Patent term restoration, however, cannot extend the remaining term of a patent beyond a total of 14 years from the product's approval date. The United States Patent and Trademark Office, or USPTO, in consultation with the FDA, reviews and approves the application for any patent term extension or restoration. In the future, we may apply for restoration of patent term for our currently owned or licensed patents to add patent life beyond its current expiration date, depending on the expected length of the clinical trials and other factors involved in the filing of the relevant NDA or BLA.

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 United States to the first applicant to gain approval of an NDA for a new chemical entity; a drug is a new chemical entity if the FDA has not previously approved any other new drug containing the same active moiety, which is the molecule or ion responsible for the action of the drug substance.

An abbreviated approval pathway for biological products shown to be biosimilar to, or interchangeable with, an FDA-licensed reference biological product was created by the Biologics Price Competition and Innovation Act of 2009, or BPCI Act, as part of the Affordable Care Act. Biosimilarity, which requires that the biological product be highly similar to the reference product notwithstanding minor differences in clinically inactive components and that there be no clinically meaningful differences between the product and the reference product in terms of safety, purity and potency, can be shown through analytical studies, animal studies and a clinical trial or trials. Complexities associated with the larger, and often more complex, structure of biological products as compared to small molecule drugs, as well as the processes by which such products are manufactured, pose significant hurdles to implementation that are still being worked out by the FDA.

A reference biological product is granted twelve years of data exclusivity from the time of first licensure of the product, and the FDA will not accept an application for a biosimilar or interchangeable product based on the reference biological product until four years after the date of first licensure of the reference product. "First licensure" typically means the initial date the particular product at issue was licensed in the United States. It is necessary to determine whether a new product includes a modification to the structure of a previously licensed product that results in a change in safety, purity, or potency to assess whether the licensure of the new product is a first licensure that triggers its own period of exclusivity and, for subsequent applications, such determinations are made a case-by-case basis with data submitted by the sponsor. As of January 31, 2019, the FDA has approved 17 biosimilar products for use in the United States. No interchangeable biosimilars have been approved.

Pediatric Exclusivity

Pediatric exclusivity is another type of regulatory exclusivity in the United States. Pediatric exclusivity, if granted, adds six months to existing regulatory exclusivity periods or patent protection. This six-month exclusivity may be granted

based on the voluntary completion of a pediatric trial in accordance with an FDA-issued "Written Request" for such a trial. Furthermore, a biological product seeking licensure as biosimilar to or interchangeable with a reference product indicated for a rare disease or condition and granted seven years of orphan drug exclusivity may not be licensed by the FDA for the protected orphan indication until after the expiration of the seven-year orphan drug exclusivity period or the 12-year reference product exclusivity, whichever is later.

Foreign Regulation

As in the United States, we will be subject to a variety of foreign regulations governing clinical trials and commercial sales and distribution of our future products and medicinal products can be marketed only if a marketing authorization from the competent regulatory agencies has been obtained.

Certain countries outside of the United States have a process that requires the submission of a clinical trial application, or CTA, much like the IND prior to the commencement of human clinical studies. In the European Union, for example, a CTA must be submitted for each clinical trial to the national health authority and an independent ethics committee in each country in which the company intends to conduct clinical trials. Once the CTA is approved in accordance with a country's requirements, the clinical trial may proceed. In all cases, the clinical trials must be conducted in accordance with GCPs and other applicable regulatory requirements and ethical principles.

To obtain regulatory approval of an investigational product under European Union regulatory systems, we must submit a marketing authorization application under either a centralized or decentralized procedure. The centralized procedure is compulsory for medicinal products produced by biotechnology. The application used to file the BLA in the United States is similar to that required in the European Union, with the exception of, among other things, region-specific document requirements.

The European Union also provides opportunities for market exclusivity. For example, upon receiving marketing authorization, innovative medicinal products generally receive eight years of data exclusivity and an additional two years of market exclusivity. If grated, data exclusivity prevents regulatory authorities in the European Union from referencing the innovator's data to assess a generic or biosimilar application. There is no guarantee that a product will be considered by the European Union's regulatory authorities to be an innovative medicinal product, and products may not qualify for data exclusivity. Products receiving orphan designation in the European Union can receive ten years of market exclusivity, during which time no similar medicinal product for the same indication may be placed on the market. An orphan product can also obtain an additional two years of market exclusivity in the European Union for pediatric studies. No extension to any supplementary protection certificate can be granted on the basis of pediatric studies for orphan indications.

If we fail to comply with applicable foreign regulatory requirements, we may be subject to, among other things, fines, suspension or withdrawal of regulatory approvals, product recalls, seizure of products, operating restrictions and criminal prosecution.

Brexit and the Regulatory Framework in the United Kingdom

On June 23, 2016, the electorate in the United Kingdom voted in favor of leaving the European Union, commonly referred to as "Brexit". Thereafter, on March 29, 2017, the country formally notified the European Union of its intention to withdraw pursuant to Article 50 of the Lisbon Treaty. The withdrawal of the United Kingdom from the European Union will take effect either on the effective date of the withdrawal agreement or, in the absence of agreement, two years after the United Kingdom provides a notice of withdrawal pursuant to the EU Treaty. Since the regulatory framework for pharmaceutical products in the United Kingdom. covering quality, safety and efficacy of pharmaceutical products, clinical trials, marketing authorization, commercial sales and distribution of pharmaceutical products is derived from European Union directives and regulations, Brexit could materially impact the future regulatory regime which applies to products and the approval of product candidates in the United Kingdom. It remains to be seen how, if at all, Brexit will impact regulatory requirements for product candidates and products in the United Kingdom.

The United Kingdom has a period of a maximum of two years from the date of its formal notification to negotiate the terms of its withdrawal from, and future relationship with, the European Union. If no formal withdrawal agreement is reached between the United Kingdom and the European Union, then it is expected the United Kingdom's membership of the European Union will automatically terminate two years after the submission of the notification of the United Kingdom's intention to withdraw from the European Union. Discussions between the United Kingdom and the European Union focused on finalizing withdrawal issues and transition agreements are ongoing. However, limited progress to date in these negotiations and ongoing uncertainty within the UK Government and Parliament sustains the possibility of the United Kingdom leaving the European Union on March 29, 2019 without a withdrawal agreement and associated transition period in place, which is likely to cause significant market and economic disruption.

General Data Protection Regulation

The collection, use, disclosure, transfer, or other processing of personal data regarding individuals in the EU, including personal health data, is subject to the EU General Data Protection Regulation, or GDPR, which became effective on May 25, 2018. The GDPR is wide-ranging in scope and imposes numerous requirements on companies that process personal data, including requirements relating to processing health and other sensitive data, obtaining consent of the individuals to whom the personal data relates, providing information to individuals regarding data processing activities, implementing safeguards to protect the security and confidentiality of personal data, providing notification of data breaches, and taking certain measures when engaging third-party processors. The GDPR also imposes strict rules on the transfer of personal data to countries outside the EU, including the U.S., and permits data protection authorities to impose large penalties for violations of the GDPR, including potential fines of up to €20 million or 4% of annual global revenues, whichever is greater. The GDPR also confers a private right of action on data subjects and consumer associations to lodge complaints with supervisory authorities, seek judicial remedies, and obtain compensation for damages resulting from violations of the GDPR. Compliance with the GDPR will be a rigorous and time-intensive process that may increase the cost of doing business or require companies to change their business practices to ensure full compliance.

Reimbursement

Sales of our products will depend, in part, on the extent to which our products will be covered by third-party payors, such as government health programs, commercial insurance and managed healthcare organizations. In the United States, no uniform policy of coverage and reimbursement for drug or biological products exists. Accordingly, decisions regarding the extent of coverage and amount of reimbursement to be provided for any of our products will be made on a payor-by-payor basis. As a result, the coverage determination process is often a time-consuming and costly process that will require us to provide scientific and clinical support for the use of our products to each payor separately, with no assurance that coverage and adequate reimbursement will be obtained.

The United States government, state legislatures and foreign governments have shown significant interest in implementing cost containment programs to limit the growth of government-paid health care costs, including price-controls, restrictions on reimbursement and requirements for substitution of generic products for branded prescription drugs. If we obtain approval in the future to market any our product candidates, we may seek approval and coverage for those products under Medicaid, Medicare and the Public Health Service pharmaceutical pricing program and may seek approval to sell the products to federal agencies. Adoption of general controls and measures, coupled with the tightening of restrictive policies in jurisdictions with existing controls and measures, could limit payments for pharmaceutical drugs.

Medicaid is a joint federal and state program that is administered by the states for low income and disabled beneficiaries. The Medicaid Drug Rebate Program requires pharmaceutical manufacturers to pay a rebate for each product reimbursed by the state Medicaid programs. The amount of the rebate for each product is set by law and may be subject to an additional discount if certain pricing increases more than inflation.

Medicare is a federal program that is administered by the federal government. The program covers individuals age 65 and over as well as those with certain disabilities. Medicare Part D provides coverage to enrolled Medicare patients for self-administered drugs (i.e., drugs that are not administered by a physician). Medicare Part D is administered by private prescription drug plans approved by the U.S. government and each drug plan establishes its own Medicare Part D formulary for prescription drug coverage and pricing, which the drug plan may modify from time to time.

Medicare Part B covers most injectable drugs given in an in-patient setting, and some drugs administered by a licensed medical provider in hospital outpatient departments and doctors' offices. Medicare Part B is administered by Medicare Administrative Contractors, which generally have the responsibility of making coverage decision. Subject to certain payment adjustments and limits, Medicare generally pays for Part B covered drugs based on a percentage of a manufacturer-reported average sales price.

As noted above, the marketability of any products 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. An increasing emphasis on cost containment measures in the United States has increased and we expect will continue to increase the pressure on pharmaceutical pricing. 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.

In addition, in most foreign countries, the proposed pricing for a drug must be approved before it may be lawfully marketed. The requirements governing drug pricing and reimbursement vary widely from country to country. There

can be no assurance that any country that has price controls or reimbursement limitations for pharmaceutical products will allow favorable reimbursement and pricing arrangements for any of our products. Historically, products launched in the European Union do not follow price structures of the United States and generally prices tend to be significantly lower.

Healthcare Reform

A primary trend in the U.S. healthcare industry and elsewhere is cost containment. There have been a number of federal and state proposals during the last few years regarding the pricing of pharmaceutical and biopharmaceutical products, limiting coverage and reimbursement for drugs and other medical products, government control and other changes to the healthcare system in the United States. By way of example, the United States and state governments continue to propose and pass legislation designed to reduce the cost of healthcare. In March 2010, the United States Congress enacted the Affordable Care Act, or ACA, which, among other things, includes changes to the coverage and payment for products under government health care programs.

Since enactment of the ACA, there have been numerous legal challenges and Congressional actions to repeal and replace provisions of the law. For example, with enactment of the Tax Cuts and Jobs Act of 2017, Congress repealed the "individual mandate." The repeal of this provision, which requires most Americans to carry a minimal level of health insurance, becomes effective in 2019. According to the Congressional Budget Office, the repeal of the individual mandate will cause 8.67 million fewer Americans to be insured in 2027 and premiums in insurance markets may rise.

Further, there have been several recent U.S. congressional inquiries and proposed federal and proposed and enacted state legislation designed to, among other things, bring more transparency to drug pricing, review the relationship between pricing and manufacturer patient programs, reduce the costs of drugs under Medicare and reform government program reimbursement methodologies for drug products. At the federal level, Congress and the current administration have each indicated that it will continue to seek new legislative and/or administrative measures to control drug costs. At the state level, individual states are 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, and, in some cases, designed to encourage importation from other countries and bulk purchasing.

Employees

As of December 31, 2018, we had 115 full-time employees. Of these full-time employees, 37 have Ph.D. or M.D. degrees and 86 are engaged in research and development 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 March 2012. Our principal offices are located at 780 Memorial Drive, Cambridge, MA 02139, and our telephone number is (857) 259-3840.

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: (i) the last day of the fiscal year (a) following the fifth anniversary of the completion of the our initial public offering in February 2017, (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 as of the prior June 30th, and (ii) the date on which we have issued more than $1.0 billion in non-convertible debt during the prior three-year period.

Our website address is www.jouncetx.com. Our website and the information contained on, or that can be accessed through, the website will not be deemed to be incorporated by reference in, and are not considered part of, this Annual Report on Form 10-K. Through our website, we make available, free of charge, our annual reports on Form 10-K, quarterly reports on Form 10-Q, current reports on Form 8-K, any amendments to those reports, proxy and registration statements, and all of our insider Section 16 reports, as soon as reasonably practicable after such material is electronically filed with, or furnished to, the Securities and Exchange Commission, or the SEC. These SEC reports can be accessed through the "Investors & Media" section of our website. The information found on our website (or that may be accessed through links on our website) is not part of this or any other report we file with, or furnish to, the SEC. You should not rely on any such information in making your decision whether to purchase our common stock.

In addition, the SEC maintains an internet site that contains reports, proxy and information statements, and other information regarding issuers that file electronically with the SEC, including us, and any document we file may be

viewed at the SEC's internet address at http://www.sec.gov (this website address is not intended to function as a hyperlink, and the information contained in the SEC's website is not intended to be a part of this filing).

Our code of conduct, corporate governance guidelines and the charters of our Audit Committee, Compensation Committee, Nominating and Corporate Governance Committee and Science and Technology Committee are available through our website at www.jouncetx.com.

Item 1A. Risk Factors

Our business is subject to numerous risks. The following important factors, among others, could cause our actual results to differ materially from those expressed in forward-looking statements made by us or on our behalf in this Annual Report on Form 10-K and other filings with the Securities and Exchange Commission, or the SEC, press releases, communications with investors, and oral statements. Actual future results may differ materially from those anticipated in our forward-looking statements. We undertake no obligation to update any forward-looking statements, whether as a result of new information, future events, or otherwise.

Risks Related to Product Development and Regulatory Process

We are early in our development efforts. Our product candidates vopratelimab (formerly JTX-2011) and JTX-4014 are clinical-stage programs and JTX-8064 and other future product candidates are in preclinical or earlier stages of development. If we are unable to advance vopratelimab, JTX-4014 or JTX-8064 through clinical development, advance other future product candidates to clinical development or obtain marketing approval and ultimately commercialize any product candidates or experience significant delays in doing so, our business will be materially harmed.

We are early in our development efforts: vopratelimab and JTX-4014 are our only clinical-stage product candidates, and JTX-8064 and other future product candidates are in preclinical or earlier stages of development. We have invested substantially all of our efforts and financial resources in the identification of targets and early stage, preclinical and clinical development of monoclonal antibodies, including the development of vopratelimab, JTX-4014 and JTX-8064.

Our other efforts have been invested in early stage, preclinical and earlier development programs. Our ability to generate product revenues, which we do not expect will occur for many years, if ever, will depend heavily on the successful development and eventual commercialization of vopratelimab, JTX-4014, JTX-8064 or other future product candidates, which may never occur. We currently generate no revenues from sales of any products, and we may never be able to develop or commercialize a marketable product. Vopratelimab, JTX-4014, JTX-8064 and other future product candidates will require additional preclinical and clinical development, management of clinical, preclinical and manufacturing activities, marketing approval in the United States and other markets, demonstrating effectiveness to pricing and reimbursement authorities, obtaining sufficient manufacturing supply for both clinical development and commercial production, building of a commercial organization, and substantial investment and significant marketing efforts before we generate any revenues from product sales. In addition, our product development programs contemplate the development of complementary diagnostics and/or companion diagnostics, which are assays or tests to identify an appropriate patient population. Complementary diagnostics and companion diagnostics are subject to regulation as medical devices and, if there are no adequate complementary diagnostics and/or companion diagnostics currently on the market for our product candidates, we may elect to advance a diagnostic and that diagnostic would have to be approved or cleared for marketing by the Food and Drug Administration, or FDA, or comparable foreign regulatory agencies before we could commercialize it. The success of vopratelimab, JTX-4014, JTX-8064 and other future product candidates will depend on several factors, including the following:

- successful completion of preclinical studies and advancement to clinical development of JTX-8064 and other future product candidates;
- successful completion of non-clinical toxicology studies that may be required for regulatory approval of JTX-8064;
- acceptance of investigational new drug applications, or INDs, for our planned clinical trials or future clinical trials;
- successful enrollment and completion of clinical trials;
- demonstration of a benefit/risk profile for vopratelimab, JTX-4014, JTX-8064 and other future product candidates that is sufficient to support a successful biologics license application, or BLA;
- successful development and marketing approval and clearance of complementary diagnostics and/or companion diagnostics for use with vopratelimab, JTX-4014, JTX-8064 or other future product candidates, if applicable;
- receipt and maintenance of marketing approvals from applicable regulatory authorities;
- approval by national pricing and reimbursement agencies (such as NICE, National Institute for Health Care and Excellence in the United Kingdom);

- establishing agreements with third-party manufacturers for clinical supply for our clinical trials and commercial manufacturing, if our product candidate is approved;
- obtaining and maintaining patent and trade secret protection or regulatory exclusivity for our product candidates;
- launching commercial sales of vopratelimab, JTX-4014, JTX-8064 or other future product candidates, if and when approved;
- acceptance of our product candidates, if and when approved, by patients, the medical community and third-party payors;
- effectively competing with other therapies;
- obtaining and maintaining healthcare coverage and adequate reimbursement;
- enforcing and defending intellectual property rights and claims;
- successful completion of clinical confirmatory trials to verify clinical benefit, if applicable; and
- maintaining a continued acceptable safety profile of the product candidates following approval.

If we do not achieve one or more of these factors in a timely manner or at all, we could experience significant delays or an inability to successfully commercialize vopratelimab, JTX-4014, JTX-8064 or other future product candidates, which would materially harm our business. If we do not receive marketing approvals for vopratelimab, JTX-4014, JTX-8064 or other future product candidates, we may not be able to continue our operations.

We rely on our Translational Science Platform to identify and develop product candidates. Our competitive position could be materially harmed if our competitors develop a platform similar to our Translational Science Platform and develop rival product candidates.

We rely on unpatented know-how, inventions and other proprietary information, to maintain our competitive position. We consider know-how to be our primary intellectual property with respect to our Translational Science Platform. Know-how can be difficult to protect. In particular, we anticipate that with respect to this platform, this know-how may over time be disseminated within the industry through independent development, the publication of journal articles describing the methodology, and the movement of skilled personnel.

We cannot rule out that our competitors may have or obtain the knowledge necessary to analyze and characterize tumors for the purpose of identifying and developing products that could compete with the product candidates we develop. Our competitors may also have significantly greater financial, product development, technical, and human resources and access to other human tumors than we do and may have significantly greater experience in using translational science methodology to identify and develop product candidates.

We may not be able to prohibit our competitors from using translational science methods to develop product candidates, including such methods that are the same as or similar to our own. If our competitors use translational science methods to identify and develop products that compete with vopratelimab, JTX-4014, JTX-8064 or other future product candidates we develop, our ability to develop and market a promising product or product candidate may diminish substantially, which could have a material adverse effect on our business prospects, financial condition, and results of operations.

Clinical product development involves a lengthy and expensive process, with an uncertain outcome. We will incur additional costs in connection with, and may experience delays, in completing, or ultimately be unable to complete, the development and commercialization of vopratelimab, JTX-4014, JTX-8064 and other future product candidates, and any complementary diagnostics and/or companion diagnostics.

Our product candidates vopratelimab and JTX-4014 are clinical-stage programs and JTX-8064 and other future product candidates are in preclinical or earlier stages of development. The risk of failure at any stage of clinical or preclinical development is high. It is impossible to predict when or if vopratelimab, JTX-4014, JTX-8064 and other future product candidates will prove effective and safe in humans and will receive marketing approval. Before obtaining marketing approval from regulatory authorities for the sale of our product candidates, we must complete preclinical studies and then conduct extensive clinical trials to demonstrate the safety and efficacy of vopratelimab, JTX-4014, JTX-8064 and other future product candidates in humans. Clinical testing is expensive, difficult to design and implement, can take many years to complete or may be delayed and is uncertain as to outcome. A failure of one or more clinical trials can occur at any stage of testing. The outcome of preclinical development testing and early clinical trials may not be predictive of the success of later clinical trials, and interim results of a clinical trial do not necessarily predict final results. Moreover, preclinical and clinical data are often susceptible to varying interpretations and analyses, and many

companies that have believed their product candidates performed satisfactorily in preclinical studies and clinical trials have nonetheless failed to obtain marketing approval of their product candidates. Our preclinical studies and clinical trials may not be successful.

The FDA or comparable foreign regulatory authorities could change their position on the acceptability of our trial designs or the clinical endpoints selected, which may require us to complete more preclinical studies or provide additional data before continuing clinical trials. In the event we are required to satisfy additional FDA requests, the completion of our clinical trials for vopratelimab and JTX-4014 may be delayed. Successful completion of our clinical trials is a prerequisite to submitting a BLA to the FDA and a Marketing Authorization Application, or MAA, in Europe for vopratelimab, JTX-4014, JTX-8064 and other future product candidates and, consequently, the ultimate approval and commercial marketing of vopratelimab, JTX-4014, JTX-8064 and other future product candidates. We do not know whether any of our clinical trials will be completed on schedule, if at all.

We may experience delays in completing our preclinical studies and initiating or completing clinical trials, and we may experience numerous unforeseen events during, or as a result of, any potential future clinical trials that could delay or prevent our ability to receive marketing approval of vopratelimab, JTX-4014, JTX-8064 and other future product candidates, including:

- regulators, institutional review boards, or IRBs, or ethics committees may not authorize us or our investigators to commence a clinical trial or conduct a clinical trial at a prospective trial site;
- we may experience delays in reaching, or fail to reach, agreement on acceptable terms with prospective trial sites and prospective contract research organizations, or CROs;
- clinical trials may produce negative or inconclusive results, and we may decide, or regulators may require us, to conduct additional preclinical studies or clinical trials or abandon product development programs;
- the number of patients required for clinical trials may be larger than we anticipate;
- it may be difficult to enroll a sufficient number of patients with a predictive biomarker or enrollment in these clinical trials may be slower than we anticipate or participants may drop out of these clinical trials or fail to return for post-treatment follow-up at a higher rate than we anticipate;
- our third-party contractors may fail to comply with regulatory requirements or meet their contractual obligations to us in a timely manner, or at all, or may deviate from the clinical trial protocol or drop out of the trial, which may require that we add new clinical trial sites or investigators;
- we may elect to, or regulators or IRBs or ethics committees may require that we or our investigators, suspend or terminate clinical research for various reasons, including noncompliance with regulatory requirements or a finding that the participants are being exposed to unreasonable and significant health risks;
- the cost of clinical trials may be greater than we anticipate;
- the supply or quality of materials or other materials necessary to conduct clinical trials may be insufficient or inadequate;
- the size of the patient population required to validate our biomarker-driven strategy may be larger than we anticipate;
- competitors may obtain regulatory approval ahead of us for compounds similar to ours, preventing us from obtaining regulatory approval despite positive clinical data;
- our product candidates may have undesirable side effects or other unexpected characteristics, causing us to suspend or terminate the trials, or reports may arise from preclinical or clinical testing of other similar cancer therapies that raise safety or efficacy concerns about our product candidates; and
- the FDA or other regulatory authorities may require us to submit additional data or impose other requirements before permitting us to initiate or continue a clinical trial.

We could encounter delays if a clinical trial is suspended or terminated by us, by the IRBs of the institutions in which such trials are being conducted or ethics committees, or by the FDA or other regulatory authorities, or recommended for suspension or termination by the Data Safety Monitoring Board, or DSMB, for such trial. Such authorities or we may impose such a suspension or termination due to a number of factors, including failure to conduct the clinical trial in accordance with regulatory requirements or our clinical protocols, inspection of the clinical trial operations or trial site by the FDA or other regulatory authorities resulting in the imposition of a clinical hold, unforeseen safety issues or adverse side effects, including those issues or effects seen in other drugs or drug candidates in the class to which

our drug candidates belong, failure to demonstrate a benefit from using a product, changes in governmental regulations or lack of adequate funding to continue the clinical trial. Many of the factors that result in a delay in the commencement or completion of clinical trials may also ultimately lead to the denial of marketing approval of our product candidates. Further, regulatory authorities may disagree with our clinical trial design and our interpretation of data from clinical trials or may change the requirements for approval even after such authorities have reviewed and commented on the design for our clinical trials.

If we are required to conduct additional clinical trials or other testing, if the results of these trials or tests are not positive or are only modestly positive or if there are safety concerns, or if we are unable to successfully complete clinical trials or other testing of vopratelimab, JTX-4014, JTX-8064 and other future product candidates, we may:

- be delayed in obtaining marketing approval for our product candidates;
- not obtain marketing approval at all;
- obtain approval for indications or patient populations that are not as broad as intended or desired;
- be subject to post-marketing testing requirements; or
- have the product removed from the market after obtaining marketing approval.

Our product development costs will also increase if we experience delays in testing or marketing approvals. We do not know whether any of our clinical trials will need to be restructured, will be completed on schedule, or will begin as planned, if at all. Any delays in our preclinical or future clinical development programs may harm our business, financial condition and prospects significantly.

If we encounter difficulties enrolling patients in our clinical trials, our clinical development activities could be delayed or otherwise be adversely affected.

The timely completion of clinical trials in accordance with their protocols depends, among other things, on our ability to enroll a sufficient number of patients who remain in the study until its conclusion. We may experience difficulties in patient enrollment in our clinical trials for a variety of reasons. The enrollment of patients depends on many factors, including:

- the patient eligibility criteria defined in the protocol;
- our ability to identify and enroll sufficient number of patients with a predictive biomarker;
- the size of the patient population required for analysis of the trial's primary endpoints;
- the proximity of patients to study sites;
- the design of the trial;
- our ability to recruit clinical trial investigators with the appropriate competencies and experience;
- clinicians' and patients' perceptions of the potential advantages of the product candidate being studied in relation to other available therapies;
- our ability to obtain and maintain patient consents for participation in our clinical trials and, where appropriate, biopsies for future patient enrichment efforts; and
- the risk that patients enrolled in clinical trials will drop out of the trials before completion or, because they are late-stage cancer patients, will not survive the full terms of the clinical trials.

In addition, our clinical trials will compete with other clinical trials for product candidates that are in the same therapeutic areas as vopratelimab, JTX-4014, JTX-8064 and other future product candidates. This competition will reduce the number and types of patients available to us, because some patients who might have opted to enroll in our trials may instead opt to enroll in a trial conducted by one of our competitors. Since the number of qualified clinical investigators is limited, we expect to conduct some of our clinical trials at the same clinical trial sites that some of our competitors use, which will reduce the number of patients who are available for our clinical trials at such sites. Moreover, because vopratelimab, JTX-4014, JTX-8064 and other future product candidates represent a departure from more commonly used methods for cancer treatment, potential patients and their doctors may be inclined to use conventional therapies, such as chemotherapy, rather than enroll patients in our ongoing or any future clinical trial.

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 vopratelimab, JTX-4014, JTX-8064 and other future product candidates.

Vopratelimab, JTX-4014, JTX-8064 and other future product candidates we develop may cause undesirable side effects or have other properties when used alone or in combination with other approved pharmaceutical products or investigational new drugs that could halt their clinical development, prevent their marketing approval, limit their commercial potential or result in significant negative consequences.

Although vopratelimab, JTX-4014, JTX-8064 and other future product candidates will undergo safety testing to the extent possible and, where applicable, under such conditions discussed with regulatory authorities, not all adverse effects of drugs can be predicted or anticipated. In order to obtain marketing approval of a product candidate, we must demonstrate safety in various non-clinical and clinical tests. At the time of initiating human clinical trials, we may not have conducted or may not conduct the types of non-clinical testing ultimately required by regulatory authorities, or future non-clinical tests may indicate that our product candidates are not safe for use. Non-clinical testing and clinical testing are both expensive and time-consuming and have uncertain outcomes.

Immunotherapy, and its method of action of harnessing the body's immune system, is powerful and could lead to serious side effects that we only discover in clinical trials. Undesirable or clinically unmanageable side effects could occur and cause us or regulatory authorities to interrupt, delay or halt clinical trials and could result in a more restrictive label or the delay or denial of marketing approval by the FDA or comparable foreign regulatory authorities. Results of our trials could reveal a high and unacceptable severity and prevalence of side effects or unexpected characteristics. Unforeseen side effects from vopratelimab, JTX-4014, JTX-8064 and other future product candidates could arise either during clinical development or, if such side effects are more rare, after vopratelimab, JTX-4014, JTX-8064 and other future product candidates have been approved by regulatory authorities and the approved product has been marketed, resulting in the exposure of additional patients. Although we have established that vopratelimab is safe in humans, we cannot predict if future clinical trials of our product candidates, either alone or in combination with other therapies, will demonstrate safety in humans. If vopratelimab, JTX-4014, JTX-8064 or other future product candidates we develop fail to demonstrate safety and efficacy in clinical trials or do not gain marketing approval, we will not be able to generate revenue and our business will be harmed.

We cannot predict whether future safety and toxicology studies may cause undesirable effects. In addition, success in initial tests does not ensure that later testing will be successful. Our product candidates could cause undesirable side effects similar to those toxicities observed in other immunotherapies. It remains possible that new or more severe toxicities could be seen if vopratelimab, JTX-4014 or JTX-8064 is used in combination with other agents. Such toxicities, if observed, could result in development delays, a determination by the FDA or other regulatory authorities that additional safety testing is required, delay or denial of approval, or limit the labeling and thus overall market scope for vopratelimab, JTX-4014 or JTX-8064.

If unacceptable toxicities arise in the development of vopratelimab, JTX-4014, JTX-8064 and other future product candidates, we or a future collaborator could suspend or terminate our trials, or the FDA or comparable foreign regulatory authorities could order us to cease clinical trials or deny approval of vopratelimab, JTX-4014, JTX-8064 and other future product candidates for any or all targeted indications. Treatment-related side effects could also affect patient recruitment or the ability of enrolled subjects to complete the trial or result in potential product liability claims. In addition, these side effects may not be appropriately recognized or managed by the treating medical staff, particularly outside of our existing or future collaborators as toxicities resulting from cancer immunotherapies are not normally encountered in the general patient population and by medical personnel. We expect to have to train medical personnel using vopratelimab, JTX-4014 or JTX-8064 to understand the side effect profile of vopratelimab, JTX-4014 or JTX-8064, as applicable, for both our ongoing and planned clinical trials and upon commercialization of vopratelimab, JTX-4014 or JTX-8064. The inability to recognize and manage the potential side effects of vopratelimab, JTX-4014 or JTX-8064 could result in patient deaths. Any of these occurrences may prevent us from achieving or maintaining market acceptance of the affected product candidate and may harm our business, financial condition and prospects significantly.

We may seek a Breakthrough Therapy Designation or Fast Track Designation by the FDA for vopratelimab, JTX-4014, JTX-8064 and other future product candidates, and we may be unsuccessful. If we are successful, the designation may not actually lead to a faster development or regulatory review or approval process, and it does not increase the likelihood that vopratelimab, JTX-4014, JTX-8064 and other future product candidates will receive marketing approval.

We may seek a Breakthrough Therapy Designation or Fast Track Designation for vopratelimab, JTX-4014, JTX-8064 and other future product candidates. A breakthrough therapy is defined as a drug that is intended, alone or in combination

with one or more other drugs, to treat a serious or life-threatening disease or condition, and preliminary clinical evidence indicates that the drug may demonstrate substantial improvement over currently approved therapies on one or more clinically significant endpoints, such as substantial treatment effects observed early in clinical development. Fast Track Designation may be available if a product is intended for the treatment of a serious or life-threatening condition and preclinical or clinical data demonstrate the potential to address an unmet medical need for this condition. Drugs that receive Breakthrough Therapy Designation or Fast Track Designation by the FDA are eligible for accelerated approval and priority review.

The FDA has broad discretion whether or not to grant Breakthrough Therapy Designation or Fast Track Designation. Even if we receive Breakthrough Therapy Designation or Fast Track Designation for a product candidate, such designation may not result in a faster development process, review or approval compared to conventional FDA procedures and does not assure ultimate approval by the FDA. In addition, even if vopratelimab, JTX-4014, JTX-8064 or other future product candidates receive Breakthrough Therapy Designation or Fast Track Designation, the FDA may later decide that the drugs no longer meet the conditions for qualification and rescind the designation.

We may seek Orphan Drug Designation for vopratelimab, JTX-4014, JTX-8064 and other future product candidates, and we may be unsuccessful or may be unable to maintain the benefits associated with Orphan Drug Designation, including the potential for market exclusivity.

As part of our business strategy, we may seek Orphan Drug Designation for vopratelimab, JTX-4014, JTX-8064 and other future product candidates, and we may be unsuccessful. In the United States, Orphan Drug Designation entitles a party to financial incentives such as opportunities for grant funding towards clinical trial costs, tax advantages and user-fee waivers.

In Europe, Orphan Drug Designation entitles a party to a number of incentives, such as protocol assistance and scientific advice specifically for designated orphan medicines, and potential fee reductions depending on the status of the sponsor.

Generally, if a drug with an Orphan Drug Designation subsequently receives the first marketing approval for the indication for which it has such designation, the drug is entitled to a period of marketing exclusivity, which precludes the European Medicines Agency or the FDA from approving another marketing application for the same drug and indication for a set time period, except in limited circumstances.

Even if we obtain orphan drug exclusivity for a drug, that exclusivity may not effectively protect the drug from competition because different drugs can be approved for the same condition, or the drug may be used off-label. Even after an orphan drug is approved, the FDA can subsequently approve another drug for the same condition if the FDA concludes that the other drug is clinically superior. In addition, a designated orphan drug may not receive orphan drug exclusivity if it is approved for a use that is broader than the indication for which it received orphan designation. Moreover, orphan drug exclusive marketing rights in the United States may be lost if the FDA later determines that the request for designation was materially defective or if the manufacturer is unable to assure sufficient quantity of the drug to meet the needs of patients with the rare disease or condition. Orphan Drug Designation neither shortens the development time or regulatory review time of a drug nor gives the drug any advantage in the regulatory review or approval process. While we may seek Orphan Drug Designation for applicable indications for vopratelimab, JTX-4014, JTX-8064 and other future product candidates, we may never receive such designations. Even if we do receive such designations, there is no guarantee that we will enjoy the benefits of those designations.

The marketing approval process is expensive, time consuming and uncertain and may prevent us or any of our existing or future collaboration partners from obtaining approvals for the commercialization of vopratelimab, JTX-4014, JTX-8064 and other future product candidates.

Among other things, the research, testing, manufacturing, labeling, approval and license maintenance, selling, import and export, marketing and distribution of biologic products are subject to extensive regulation by the FDA and comparable foreign regulatory authorities. Neither we nor any existing or future collaboration partner is permitted to market vopratelimab, JTX-4014, JTX-8064 and any other future products in the United States until we receive approval of a BLA from the FDA. We have never submitted an application for, or received, marketing approval. Obtaining approval of a BLA can be a lengthy, expensive and uncertain process. In addition, failure to comply with FDA and other applicable domestic and foreign regulatory requirements may subject us to administrative or judicially imposed sanctions, including the following:

- untitled and warning letters;
- civil or criminal penalties and fines;

- injunctions;
- suspension or withdrawal of marketing approval;
- suspension of any ongoing clinical trials;
- product recalls;
- refusal to accept or approve BLAs or supplements thereto filed by us;
- restrictions on operations, including costly new manufacturing requirements; or
- seizure or detention of our products or import bans.

Prior to receiving approval to commercialize our product candidates in the United States or abroad, we and any of our existing or future collaboration partners must demonstrate with substantial evidence from well-controlled clinical trials, and to the satisfaction of the FDA and comparable foreign regulatory authorities, that such product candidates are safe and effective for their intended uses. Even if we and any of our existing or future collaboration partners believe the preclinical or clinical data for vopratelimab, JTX-4014, JTX-8064 and other future product candidates are promising, such data may not be sufficient to support approval by the FDA and comparable foreign regulatory authorities. Administering our product candidates to humans may produce undesirable side effects, which could interrupt, delay or cause suspension of clinical trials of our product candidates and result in the FDA or other regulatory authorities denying approval of vopratelimab, JTX-4014, JTX-8064 and other future product candidates for any or all targeted indications.

Marketing approval of a BLA is not guaranteed, and the approval process is expensive and may take several years. The FDA also has substantial discretion in the approval process. Despite the time and expense exerted, failure can occur at any stage, and we could encounter problems that cause us to abandon or repeat clinical trials or perform additional preclinical studies and clinical trials. The number of preclinical studies and clinical trials that will be required for FDA approval varies depending on the product candidate, the disease or condition that the product candidate is designed to address and the regulations applicable to any particular product candidate. The FDA can delay, limit or deny approval of a product candidate for many reasons, including, but not limited to, the following:

- a product candidate may not be deemed safe or effective;
- FDA officials may not find the data from preclinical studies and clinical trials sufficient;
- the FDA might not deem our or our third-party manufacturers' processes or facilities adequate for approval of our marketing applications; or
- the FDA may change its approval policies or adopt new regulations.

If vopratelimab, JTX-4014, JTX-8064 and other future product candidates fail to demonstrate safety and efficacy in clinical trials or do not gain marketing approval, our business will be harmed.

We may choose not to develop a potential product candidate, or we may suspend or terminate one or more discovery or preclinical programs related to our product candidates.

At any time and for any reason, we may determine that one or more of our discovery programs, preclinical programs or product candidates does not have sufficient potential to warrant the allocation of resources toward such program or product candidate. Furthermore, because we have limited financial and personnel resources, we are placing significant focus on the development of our product candidates vopratelimab, JTX-4014 and JTX-8064. Accordingly, we may choose not to develop a product candidate or elect to suspend or terminate one or more of our discovery or preclinical programs. If we suspend or terminate a program or product candidate in which we have invested significant resources, we will have expended resources on a program or product candidate that will not provide a full return on our investment and we may have missed an opportunity to have allocated those resources to potentially more productive uses, including existing or future programs or product candidates. If we do not accurately evaluate the commercial potential or target market for a particular future product candidate, we may relinquish valuable rights to future product candidates through collaboration, licensing or other royalty arrangements.

Even if we complete the necessary clinical trials, we cannot predict when or if we will obtain marketing approval to commercialize a product or the approval may be for a narrower indication than we expect.

We cannot commercialize a product candidate until the appropriate regulatory authorities have reviewed and approved the product candidate. Even if our product candidates demonstrate safety and efficacy in clinical trials, the regulatory agencies may not complete their review processes in a timely manner, or we may not be able to obtain marketing

approval. In addition, we may experience delays or rejections based upon government regulation or changes in regulatory agency policy during the period of product development. Regulatory agencies also may impose significant limitations in the form of narrow indications, warnings, precautions or contraindications with respect to conditions of use or may grant approval subject to the performance of costly post-marketing clinical trials or may not approve the price we intend to charge for our product candidates. Any of the foregoing scenarios could materially harm the commercial prospects for vopratelimab, JTX-4014, JTX-8064 and other future product candidates.

Obtaining and maintaining marketing approval of vopratelimab, JTX-4014, JTX-8064 or other future product candidates in one jurisdiction does not mean that we will be successful in obtaining marketing approval of that product candidate in other jurisdictions.

Obtaining and maintaining marketing approval of vopratelimab, JTX-4014, JTX-8064 and other future product candidates in one jurisdiction does not guarantee that we will be able to obtain or maintain marketing approval in any other jurisdiction. For example, even if the FDA grants marketing approval of a product candidate, comparable regulatory authorities in foreign jurisdictions must also approve the manufacturing, marketing and promotion of the product candidate in those countries. Approval procedures vary among jurisdictions and can involve requirements and administrative review periods different from, and greater than, those in the United States, including additional preclinical studies or clinical trials.

Obtaining foreign marketing approvals and compliance with foreign regulatory requirements could result in significant delays, difficulties and costs for us and could delay or prevent the introduction of our products in certain countries. If we fail to comply with the regulatory requirements in international markets and/or receive applicable marketing approvals, our target market will be reduced and our ability to realize the full market potential of vopratelimab, JTX-4014, JTX-8064 and other future product candidates will be harmed. Even if we obtain approval for our product candidates and ultimately commercialize them in foreign markets, we would be subject to separate risks and uncertainties, including the burden of complying with complex and changing foreign regulatory, tax, accounting and legal requirements and the reduced protection of intellectual property rights in some foreign countries.

Our failure to successfully identify, discover, acquire, develop or commercialize additional products or product candidates could impair our ability to grow.

Although a substantial amount of our efforts will focus on the clinical testing and potential approval of our most advanced product candidate, vopratelimab, and our other product candidates, JTX-4014 and JTX-8064, an element of our long-term growth strategy is to in-license products or product candidates for development and commercialization. We may never be able to identify, discover, acquire, develop or commercialize any products or product candidates, which would have a material adverse effect on our business.

Because our internal research capabilities are limited, we may be dependent upon pharmaceutical and biotechnology companies, academic scientists, and other researchers to sell or license products or technology to us. The success of this strategy depends partly upon our ability to identify, select, and acquire promising pharmaceutical product candidates and products. The process of proposing, negotiating and implementing a license or acquisition of a product candidate or approved product is lengthy and complex. Other companies, including some with substantially greater financial, marketing and sales resources, may compete with us for the license or acquisition of product candidates and approved products. Acquisitions and in-licenses include numerous risks, including potential failure to achieve the expected benefits of the acquisition or license and potential unknown liabilities associated with the product or technology. We have limited resources to identify and execute the acquisition or in-licensing of third-party products, businesses, and technologies, integrate them into our current infrastructure and manage our development efforts.

Even if we receive marketing approval of vopratelimab, JTX-4014, JTX-8064 or other future product candidates, we will be subject to ongoing regulatory obligations and continued regulatory review.

Any marketing approvals that we receive for vopratelimab, JTX-4014, JTX-8064 and other future product candidates may be subject to limitations on the approved indicated uses for which the product may be marketed or the conditions of approval or contain requirements for potentially costly post-market testing and surveillance to monitor the safety and efficacy of the product candidate. In addition, if the FDA or a comparable foreign regulatory authority approves vopratelimab, JTX-4014, JTX-8064 and other future product candidates, the manufacturing processes, labeling, packaging, distribution, adverse event reporting, storage, advertising, promotion, import and export and record keeping for vopratelimab, JTX-4014, JTX-8064 and other future product candidates will be subject to extensive and ongoing regulatory requirements. These requirements include submissions of safety and other post-marketing information and reports, registration, as well as continued compliance with current good manufacturing practice, or cGMP, and good clinical practice, or GCP, for any clinical trials that we conduct post-approval. Failure to comply with regulatory requirements, may result in, among other things:

- restrictions on the marketing or manufacturing of our product candidates, withdrawal of the product from the market, or product recalls;
- fines, untitled and warning letters, or holds on clinical trials;
- refusal by the FDA to approve pending applications or supplements to approved applications we filed or suspension or revocation of license approvals;
- product seizure or detention, or refusal to permit the import or export of our product candidates; and
- injunctions or the imposition of civil or criminal penalties.

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 abroad. If we are slow or unable to adapt to changes in existing requirements or the adoption of new requirements or policies, or if we are not able to maintain regulatory compliance, we may lose any marketing approval that we may have obtained, and we may not achieve or sustain profitability.

Even if vopratelimab, JTX-4014, JTX-8064 and other future product candidates receive marketing approval, they may fail to achieve the degree of market acceptance by physicians, patients, third-party payors and others in the medical community necessary for commercial success.

If vopratelimab, JTX-4014, JTX-8064 and other future product candidates receive marketing approval, whether as a single agent or in combination with other therapies, they may nonetheless fail to gain sufficient market acceptance by physicians, patients, third-party payors, and others in the medical community. If vopratelimab, JTX-4014, JTX-8064 and other future product candidates do not achieve an adequate level of acceptance, we may not generate significant product revenues and we may not become profitable.

Risks Related to Manufacturing, Commercialization and Reliance on Third Parties

We depend on our collaboration with Celgene and may depend on collaborations with additional third parties for the development and commercialization of our product candidates. If our collaborations are not successful, we may not be able to capitalize on the market potential of these product candidates.

In July 2016, we entered into a Master Research and Collaboration Agreement, or the Celgene Collaboration Agreement, with Celgene Corporation, or Celgene, focused on developing and commercializing biologic immunotherapies. Under our Celgene Collaboration Agreement with Celgene, Celgene may exercise options granting it certain commercialization or licensing rights for vopratelimab, JTX-4014, JTX-8064 and other product candidate programs from a pool of certain molecular targets. The collaboration involves a complex allocation of rights, provides for milestone payments to us based on the achievement of specified clinical development, regulatory and commercial milestones, provides for additional payments upon Celgene's election to exercise rights to commercialize additional product candidates or extend the research term, and provides us with profit-sharing and royalty-based revenue if certain product candidates are successfully commercialized. We cannot provide any assurance with respect to, or otherwise, the success of the collaboration. In January 2019, Celgene and Bristol-Myers Squibb Company, or BMS, announced that they entered into an agreement under which Celgene will be acquired by BMS, subject to shareholder and regulatory approvals. The transaction is currently expected to close in the third quarter of 2019. The acquisition of Celgene by BMS may result in a change in Celgene's business priorities, and as such, may lead to changes in its future operations, contracts and strategic plans, including those involving its collaboration with us, and may have a material adverse effect on our collaboration with Celgene. Any such change could affect Celgene's willingness to perform its obligations or exercise its options under the Celgene Collaboration Agreement, have an impact on Celgene's ability to retain and motivate key personnel who are important to our collaboration, reduce or terminate its efforts on the development of our product candidates, and/or cause the Celgene Collaboration Agreement to terminate. If the transaction is completed as planned, there is no guarantee that BMS will place the same emphasis on the collaboration, and our business may be harmed. In addition, BMS is a leader in the immuno-oncology field and has several programs that may be competitive with our product candidates. For example, BMS currently markets nivolumab, an anti-PD-1 antibody, and may not seek to acquire an additional anti-PD-1 antibody, which could cause BMS to decline to exercise the option for JTX-4014. As a result, if the acquisition in consummated, BMS may elect to terminate the Celgene Collaboration Agreement or may choose to advance its own programs rather than ours even if it does not terminate the Celgene Collaboration Agreement. Although we would retain worldwide rights to our programs in the event of any termination, any such termination may adversely affect our business and our stock price, and make it more difficult for us to enter into a collaboration agreement with another party.

We may form or seek other strategic alliances, joint ventures, or collaborations, or enter into additional licensing arrangements with third parties that we believe will complement or augment our development and commercialization efforts with respect to vopratelimab, JTX-4014, JTX-8064 and other future product candidates that we may develop.

Collaborations involving our product candidates, including our collaboration with Celgene, pose the following risks to us:

- Collaborators have significant discretion in determining the efforts and resources that they will apply to these collaborations. For example, under our collaboration agreement with Celgene, development and commercialization plans and strategies for licensed programs will be conducted in accordance with a plan approved by the appropriate committee comprised of representatives from both us and Celgene.
- Collaborators, including Celgene, may not pursue development and commercialization of vopratelimab, JTX-4014, JTX-8064 or other future product candidates or may elect not to continue or renew development or commercialization programs based on clinical trial results, changes in their strategic focus due to the acquisition of competitive products, availability of funding or other external factors such as a business combination that diverts resources or creates competing priorities. For example, Celgene may decline to exercise any of its options under the Celgene Collaboration Agreement and, although we would retain worldwide rights to our programs, a decision not to exercise any such option may adversely affect our business and our stock price.
- Collaborators may delay clinical trials, provide insufficient funding for a clinical trial program, stop a clinical trial, abandon a product candidate, repeat or conduct new clinical trials or require a new formulation of a product candidate for clinical testing. For example, under our collaboration agreement with Celgene, at any point in the research, development and clinical trial process, or during the term of any applicable co-development and co-commercialization or license agreement, respectively, Celgene may terminate the applicable agreement upon 120 days' prior written notice with respect to any product candidate that is subject

to the collaboration agreement without triggering a termination of the remainder of the collaboration and, under a co-development and co-commercialization agreement or a license agreement, it is possible for Celgene to terminate that agreement upon 120 days prior written notice at any point during the development or commercialization activities. If Celgene exercises any such termination right, we may not have sufficient resources to continue the research, development or commercialization of such product candidate.

- Collaborators could independently develop, or develop with third parties, products that compete directly or indirectly with our products or product candidates.
- A collaborator with marketing and distribution rights to one or more products may not commit sufficient resources to their marketing and distribution.
- Collaborators may own or co-own intellectual property covering our products that results from our collaborating with them, and in such cases, we would not have the exclusive right to develop, commercialize, enforce, maintain or defend such intellectual property.
- Collaborators may not properly enforce, maintain or defend our intellectual property rights or may use our proprietary information in a way that gives rise to actual or threatened litigation that could jeopardize or invalidate our intellectual property or proprietary information or expose us to potential litigation, or other intellectual property proceedings. For example, under certain limited circumstances, Celgene has the first right to enforce, maintain or defend our intellectual property rights under our collaboration arrangement with respect to certain licensed programs and, although we may have the right to assume the enforcement, maintenance and defense of our intellectual property rights if Celgene does not, our ability to do so may be compromised by Celgene's actions.
- Disputes may arise between a collaborator and us that cause the delay or termination of the research, development or commercialization of vopratelimab, JTX-4014, JTX-8064 and other future product candidates, or that result in costly litigation or arbitration that diverts management attention and resources. For example, although we and Celgene have agreed to the form of co-development and co-commercialization agreement and license agreement to be entered into should Celgene exercise its option for a program under the Celgene Collaboration Agreement, we may never come to agreement with Celgene on a final definitive agreement. Further, even if we do reach a definitive agreement, it may not be on terms that are as favorable to us as expected.
- Collaborations may be terminated and, if terminated, may result in a need for additional capital to pursue further development or commercialization of the applicable product candidates. For example, Celgene can terminate its agreement with us, in its entirety or with respect to any program, upon 120 days' notice and can terminate the entire agreement with us in connection with a material breach of the agreement by us that remains uncured for 90 days. If Celgene exercises such termination right, we may not have sufficient resources to continue the development of such product candidate.
- Collaboration agreements may not lead to development or commercialization of product candidates in the most efficient manner or at all.
- Collaboration agreements may restrict our right to independently pursue new product candidates. For example, if Celgene exercises its option for a program within the collaboration other than JTX-4014, then until termination or expiration of the applicable co-development and co-commercialization agreement for such program, we may not directly or indirectly research, develop, manufacture or commercialize, outside of the collaboration, any biologic medicine or product candidate with specified activity against that program's collaboration target.

As a result, if we enter into additional collaboration agreements and strategic partnerships or license our intellectual property, products or businesses, we may not be able to realize the benefit of, or generate revenues from, such arrangements.

We may seek to establish additional collaborations, and, if we are not able to establish them on commercially reasonable terms, we may have to alter our development and commercialization plans.

Our drug development programs and the potential commercialization of our product candidates will require substantial additional resources. For some of our product candidates, we may decide to collaborate with additional pharmaceutical and biotechnology companies for the development and potential commercialization of those product candidates. Any of these relationships may require us to incur non-recurring and other charges, increase our near and long-term expenditures, issue securities that dilute our existing stockholders, or disrupt our management and business.

We face significant competition in seeking appropriate strategic partners and the negotiation process is time consuming and complex. Whether we reach a definitive agreement for other collaborations 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 our business. We may not be successful in our efforts to establish a strategic partnership or other alternative arrangements for future 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 them as having the requisite potential to demonstrate safety and efficacy. In addition, there have been a significant number of recent business combinations among large pharmaceutical companies that have resulted in a reduced number of potential future collaborators.

We may also be restricted under existing collaboration agreements from entering into future agreements on certain terms with potential collaborators. For example, during the research term of our collaboration with Celgene, we may not directly or indirectly research, develop, manufacture or commercialize, except pursuant to the agreement, certain product candidates. In addition, if Celgene exercises its option for a program within the collaboration other than JTX-4014, then until termination or expiration of the applicable co-development and co-commercialization agreement for such program, we may not directly or indirectly develop, manufacture or commercialize, outside of the collaboration, any biologic medicine or product candidate with specified activity against that program's collaboration target.

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 the product candidate for which we are seeking to collaborate, reduce or delay its development program, delay or reduce the scope of potential commercialization activities, or increase our expenditures and undertake development or commercialization activities at our own expense. If we elect to increase our expenditures to fund development or commercialization activities on our own, we may need to obtain additional capital, which may not be available to us on acceptable terms or at all.

The market opportunities for vopratelimab, JTX-4014, JTX-8064 and any other future products, if and when approved, may be limited to those patients who are ineligible for established therapies or for whom prior therapies have failed, and may be small.

Cancer therapies are sometimes characterized as first-line, second-line, or third-line, and the FDA often approves new therapies initially only for third-line use. When cancer is detected early enough, first-line therapy, usually chemotherapy, hormone therapy, surgery, radiation therapy, and, increasingly, immunotherapies or a combination of these, is sometimes adequate to cure the cancer or prolong life without a cure. Second and third-line therapies are administered to patients when prior therapy is not effective. We expect to initially seek approval of vopratelimab, JTX-4014, JTX-8064 and other future product candidates as a therapy for patients who have received one or more prior treatments. Subsequently, for those products that prove to be sufficiently beneficial, if any, we would expect to seek approval potentially as a first-line therapy, but there is no guarantee that vopratelimab, JTX-4014, JTX-8064 or other future product candidates, even if approved, would be approved for first-line therapy, and, prior to any such approvals, we may have to conduct additional clinical trials.

Our projections of both the number of people who have the cancers we are targeting, as well as the subset of people with these cancers who have received one or more prior treatments, and who have the potential to benefit from treatment with vopratelimab, JTX-4014, JTX-8064 and other future product candidates, are based on our beliefs and estimates. These estimates have been derived from a variety of sources, including scientific literature, surveys of clinics, patient foundations, and market research, and may prove to be incorrect. Further, new studies may change the estimated incidence or prevalence of these cancers. The number of patients may turn out to be lower than expected. Additionally, the potentially addressable patient population for vopratelimab, JTX-4014, JTX-8064 and other future product candidates may be limited or may not be amenable to treatment with vopratelimab, JTX-4014, JTX-8064 and any other products, if and when approved. Even if we obtain significant market share for vopratelimab, JTX-4014, JTX-8064 and any other products, if and when approved, because the potential target populations may be small, we may never achieve profitability without obtaining marketing approval for additional indications, including to be used as first- or second-line therapy.

Exclusivity and other governance provisions within our collaboration agreement with Celgene may prevent us from pursuing alternative product candidates and exercising complete control over our product candidates' development.

During the research term in our collaboration agreement with Celgene, we may not alone, or with a third party, research, develop, manufacture or commercialize a biologic that binds to ICOS or a pool of certain B cell, T regulatory cell or tumor-associated macrophage targets, other than PD-1, that meet certain criteria, termed an exclusive target, and inhibit, activate or otherwise modulate the activity of such exclusive target. In addition, if Celgene exercises its option for a program within the collaboration other than JTX-4014, then until termination or expiration of the applicable co-development and co-commercialization agreement for such program, we may not directly or indirectly research, develop, manufacture or commercialize, outside of the collaboration, any biologic with specified activity against that program's collaboration target. Further, our collaboration with Celgene is governed by the joint steering committee, or JSC, and a joint patent committee. The JSC may establish additional subcommittees, to oversee particular projects or activities. Subject to limitations specified in the agreement, if the applicable governance committee is unable to make a decision by consensus and the parties are unable to resolve the issue through escalation to specified senior executive officers of the parties, then we generally have final decision-making authority over research and development matters for programs prior to Celgene's exercise of its option to such program. If Celgene exercises its option for a program, final decision-making authority for that program is specified in the applicable co-development and co-commercialization agreement or license agreement. These exclusivity and governance provisions may inhibit our development efforts and may materially harm our business, financial condition, results of operations and prospects.

We rely and expect to continue to rely on third parties to conduct our clinical trials. If these third parties do not successfully carry out their contractual duties, comply with regulatory requirements or meet expected deadlines, we may not be able to obtain marketing approval for or commercialize our product candidates and our business could be substantially harmed.

We do not have the ability to independently conduct clinical trials. We rely and will rely on medical institutions, clinical investigators, contract laboratories, and other third parties, such as CROs, to conduct or otherwise support our ongoing clinical trials, including processing of human blood and tumor samples and analysis of biomarkers from the clinical trials. We rely and will rely heavily on these parties for execution of clinical trials for vopratelimab, JTX-4014, JTX-8064 and other future product candidates and we control only certain aspects of their activities. Nevertheless, we are responsible for ensuring that each of our clinical trials is conducted in accordance with the applicable protocol, legal and regulatory requirements and scientific standards, and our reliance on these third parties including CROs will not relieve us of our regulatory responsibilities. For any violations of laws and regulations during the conduct of our clinical trials, we could be subject to untitled and warning letters or enforcement action that may include civil penalties up to and including criminal prosecution.

We and our clinical investigators and CROs are required to comply with regulations and requirements, including GCP, for conducting, monitoring, recording and reporting the results of clinical trials to ensure that the data and results are scientifically credible and accurate, and that the trial patients are adequately informed of the potential risks of participating in clinical trials and their rights are protected. If we or our clinical investigators or CROs fail to comply with applicable GCP, the clinical data generated in our clinical trials may be deemed unreliable and the FDA or comparable foreign regulatory authorities may require us to perform additional clinical trials before approving our marketing applications. We cannot assure stockholders that, upon inspection, the FDA will determine that any of our future clinical trials will comply with GCP. In addition, our clinical trials must be conducted with product candidates produced under cGMP regulations. Our failure or the failure of our clinical investigators or CROs to comply with these regulations may require us to repeat clinical trials, which would delay the marketing approval process and could also subject us to enforcement action. We also are required to register certain ongoing clinical trials and provide certain information, including information relating to the trial's protocol, on a government-sponsored database, ClinicalTrials.gov, within specific time frames. Failure to do so can result in fines, adverse publicity and civil and criminal sanctions.

Although we designed the clinical trials for vopratelimab and JTX-4014 and intend to design the clinical trials for JTX-8064 and other future product candidates, clinical investigators or CROs will conduct all of the clinical trials. As a result, many important aspects of our development programs, including their conduct and timing, will be outside of our direct control. Our reliance on third parties to conduct future clinical trials will also result in less direct control over the management of data developed through clinical trials than would be the case if we were relying entirely upon our own staff. Communicating with outside parties can be challenging, potentially leading to mistakes as well as difficulties in coordinating activities. Outside parties may also face internal challenges that may materially adversely affect the willingness or ability of such parties to conduct our clinical trials and may subject us to unexpected cost increases that are beyond our control. If the clinical investigators or CROs do not perform clinical trials in a satisfactory manner,

breach their obligations to us or fail to comply with regulatory requirements, the development, marketing approval and commercialization of vopratelimab, JTX-4014, JTX-8064 and other future product candidates may be delayed, or our development program may be materially and irreversibly harmed. If we are unable to rely on clinical data collected by our clinical investigators and CROs, we could be required to repeat, extend the duration of, or increase the size of any clinical trials we conduct, and this could significantly delay commercialization and require significantly greater expenditures.

If clinical investigators or CROs do not successfully carry out their contractual duties or obligations or meet expected deadlines, if they need to be replaced or if the quality or accuracy of the clinical data they obtain are compromised due to the failure to adhere to our clinical protocols, regulatory requirements or for other reasons, any clinical trials such clinical investigators or CROs are associated with may be extended, delayed or terminated. As a result, we believe that our financial results and the commercial prospects for vopratelimab, JTX-4014, JTX-8064 and other future product candidates in the subject indication would be harmed, our costs could increase and our ability to generate revenue could be delayed.

We face significant competition and if our competitors develop and market products that are more effective, safer or less expensive than vopratelimab, JTX-4014, JTX-8064 or other future product candidates, our commercial opportunities will be negatively impacted.

The life sciences industry is highly competitive and subject to rapid and significant technological change. We are currently developing therapeutics that will compete with other products and therapies that currently exist or are being developed, such as approved immunotherapy antibodies, the anti-ICOS antibodies of BMS, GlaxoSmithKline plc, or Kymab Group Ltd., Xenor, Inc.'s anti-PD-1 and anti-ICOS bispecific antibody or Merck & Co., Inc.'s anti-LILRB2 antibody. Products we may develop in the future are also likely to face competition from other products and therapies, some of which we may not currently be aware. Technological advances or products developed by our competitors may render our technologies or product candidates obsolete, less competitive or not economical.

We have both domestic and international competitors, including major multinational pharmaceutical companies, established biotechnology companies, specialty pharmaceutical companies, universities and other research institutions and small and other early-stage companies. Many of our competitors have significantly greater financial, manufacturing, marketing, product development, technical and human resources than we do. Large pharmaceutical companies, in particular, have extensive experience in clinical testing, obtaining marketing approvals, establishing clinical trial sites, recruiting patients and in manufacturing pharmaceutical products and may succeed in discovering, developing and commercializing products in our field before we do. We also face competition in recruiting and retaining qualified scientific and management personnel, as well as in acquiring technologies complementary to, or necessary for, our programs.

There are a large number of companies developing or marketing treatments for cancer, including many major pharmaceutical and biotechnology companies. These treatments consist both of small molecule drug products, as well as biologics approaches to address cancer. These treatments are often combined with one another in an attempt to maximize the response rate.

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, have a broader label, are marketed more effectively, are reimbursed or are less expensive than any products that we may develop. Our competitors also may obtain FDA, European Commission or other 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. Even if vopratelimab, JTX-4014, JTX-8064 and other future product candidates achieve marketing approval, they may be priced at a significant premium over competitive products, resulting in reduced competitiveness. In addition, if vopratelimab, JTX-4014, JTX-8064 and other future product candidates are approved by the FDA, the approval of a biosimilar product to one of our products could have a material impact on our business.

Because we rely on third-party manufacturing and supply partners, including a single supplier for some of our materials, our supply of research and development, preclinical and clinical development materials may become limited or interrupted or may not be of satisfactory quantity or quality.

We rely on third-party contract manufacturers to manufacture our preclinical and clinical trial product supplies. We do not own manufacturing facilities for producing such supplies. There can be no assurance that our preclinical and clinical development product supplies will not be limited, interrupted, or of satisfactory quality or continue to be available at acceptable prices. Our or a third party's failure to execute on our manufacturing requirements, or 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 vopratelimab, JTX-4014, JTX-8064 or other future product candidates under development;
- delay in submitting regulatory applications, or receiving marketing approvals, for vopratelimab, JTX-4014, JTX-8064 or other future product candidates;
- loss of cooperation of an existing or future collaborator;
- subjecting third-party manufacturing facilities or our manufacturing facilities to additional inspections by regulatory authorities; and
- requirements to cease distribution or to recall batches of vopratelimab, JTX-4014, JTX-8064 and other future product candidates.

In the event that any of our manufacturers fails to comply with applicable regulatory requirements and facility and process validation tests 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 reasonable terms, if at all. In some cases, the technical skills or technology required to manufacture our future product candidates may be unique or proprietary to the original manufacturer, which 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 such future product candidates. In particular, any replacement of our manufacturer could require significant effort and expertise because there may be a limited number of qualified replacements. 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, which could negatively affect our ability to develop product candidates in a timely manner or within budget.

Certain raw materials necessary for the manufacture of our product candidates under our current manufacturing process, such as growth media, resins and filters, are available from a single supplier. We do not have agreements in place that guarantee our supply or the price of these raw materials. Any significant delay in the acquisition or decrease in the availability of these raw materials could considerably delay the manufacture of vopratelimab, JTX-4014, JTX-8064 and other future product candidates, which could adversely impact the timing of any planned trials or the marketing approval of that product candidate.

We expect to continue to rely on third-party manufacturers if we receive marketing approval for any product candidate. If we are unable to maintain third-party manufacturing for vopratelimab, JTX-4014, JTX-8064 or obtain or maintain third-party manufacturing for other future product candidates, or to do so on commercially reasonable terms, we may not be able to develop and commercialize vopratelimab, JTX-4014, JTX-8064 or other future product candidates successfully. We do not yet have sufficient information to reliably estimate the cost of the commercial manufacture of JTX-8064 or other future product candidates.

In addition, in order to conduct clinical trials of vopratelimab, JTX-4014, JTX-8064 and other future product candidates, we will need to work with third-party manufacturers to manufacture them in large quantities. Our manufacturing partners or our third-party collaborators may be unable to successfully increase the manufacturing capacity of vopratelimab, JTX-4014, JTX-8064 and other future product candidates in a timely or cost-effective manner, or at all. In addition, quality issues may arise during scale-up activities. If our manufacturing partners or collaborators are unable to successfully scale up the manufacture of vopratelimab, JTX-4014, JTX-8064 or other future product candidates in sufficient quality and quantity, the development, testing, and clinical trials of that product candidate may be delayed or infeasible, and marketing approval or commercial launch of any resulting product may be delayed or not obtained, which could significantly harm our business.

We are subject to manufacturing risks that could substantially increase our costs and limit the supply of our products.

The process of manufacturing vopratelimab, JTX-4014, JTX-8064 or other future product candidates is complex, highly regulated and subject to several risks, including:

- We do not have the capability internally to manufacture drug products or drug substances for clinical use. We use third-party manufacturers for manufacturing vopratelimab, JTX-4014 and JTX-8064 for our on-going and

anticipated clinical trials. Any changes in our manufacturing processes as a result of scaling-up may require additional approvals or may delay the development and marketing approval of vopratelimab, JTX-4014, JTX-8064 and other future product candidates and ultimately affect our success.

- The manufacturing facilities in which vopratelimab, JTX-4014, JTX-8064 or other future product candidates are made could be adversely affected by equipment failures, contamination, vendor error, labor shortages, natural disasters, power failures and numerous other factors.
- Any adverse developments affecting manufacturing operations for vopratelimab, JTX-4014, JTX-8064 or other future product candidates, if any are approved, may result in shipment delays, inventory shortages, lot failures, product withdrawals or recalls, or other interruptions in the supply of our products. We may also have to take inventory write-offs and incur other charges and expenses for products that fail to meet specifications, undertake costly remediation efforts or seek more costly manufacturing alternatives.
- Biologics, such as vopratelimab, JTX-4014 and JTX-8064, that have been produced and are stored for later use may degrade, become contaminated, suffer other quality defects or may not be used within their shelf life, which may cause the affected product candidates to no longer be suitable for their intended use in clinical trials or other development activities. If the defective product candidates cannot be replaced in a timely fashion, we may incur significant delays in our development programs that could adversely affect the value of such product candidates.

We expect to develop vopratelimab, JTX-4014, JTX-8064 and future product candidates in combination with other drugs. If we are unable to enter into a strategic collaboration for, or if we are unable to purchase on commercially reasonable terms, an approved cancer drug to use in combination with our product candidates, we may be unable to develop or obtain approval for, vopratelimab, JTX-4014, JTX-8064 and future product candidates in combination with other drugs.

We intend to develop vopratelimab, JTX-4014, JTX-8064 and future product candidates in combination with one or more other cancer drugs. If the FDA or similar regulatory authorities outside of the United States revoke or do not grant approval of any drugs we use in combination with vopratelimab, JTX-4014, JTX-8064 or other future product candidates, we will not be able to market any products in combination with such drugs.

If safety or efficacy issues arise with any of these drugs, we could experience significant regulatory delays, and the FDA or similar regulatory authorities outside of the United States may require us to redesign or terminate the applicable clinical trials. If the drugs we use are replaced as the standard of care for the indications we choose for vopratelimab, JTX-4014, JTX-8064 or other future product candidates, the FDA or similar regulatory authorities outside of the United States may require us to conduct additional clinical trials. In addition, if manufacturing or other issues result in a shortage of supply of the drugs with which we determine to combine with vopratelimab, JTX-4014, JTX-8064 or other future product candidates, we may not be able to complete clinical development of vopratelimab, JTX-4014, JTX-8064 or other future product candidates on our current timeline or at all.

Even if vopratelimab, JTX-4014, JTX-8064 or other future product candidates were to receive marketing approval or be commercialized for use in combination with other existing drugs, we would continue to be subject to the risks that the FDA or similar regulatory authorities outside of the United States could revoke approval of such existing drugs or that safety, efficacy, manufacturing or supply issues could arise with such drugs.

We may form or seek strategic collaborations to evaluate and, if approved, market vopratelimab, JTX-4014 and JTX-8064 in combination with another approved cancer drug. If we are unable to enter into a strategic collaboration on commercially reasonable terms or fail to realize the benefits of any such collaboration, we may be required to purchase an approved cancer drug to use in combination with vopratelimab, JTX-4014 and JTX-8064. The failure to enter into a successful collaboration or the expense of purchasing an approved cancer drug may delay our development timelines, increase our costs and jeopardize our ability to develop vopratelimab, JTX-4014 and JTX-8064.

We may develop complementary diagnostics and/or companion diagnostics for vopratelimab, JTX-4014, JTX-8064 and other future product candidates. If we are unable to successfully develop such companion diagnostics or complementary diagnostics, or experience significant delays in doing so, we may not realize the full commercial potential of vopratelimab, JTX-4014, JTX-8064 or other future product candidates.

Because we are focused on patient enrichment strategies, in which predictive biomarkers may be used to identify the right patients for our product candidates, we believe that our success may depend, in part, on our ability to develop complementary diagnostics and/or companion diagnostics, which are assays or tests to identify an appropriate patient population for our product candidates. There has been limited success to date industry-wide in developing these types

of complementary diagnostics and/or companion diagnostics. To be successful, we need to address a number of scientific, technical and logistical challenges. We have not yet initiated development of complementary diagnostics and/or companion diagnostics, and the process of obtaining or creating such a diagnostic is time consuming and costly. We have little experience in the development of diagnostics and may not be successful in developing appropriate diagnostics to pair with any of our product candidates that receive marketing approval. Complementary diagnostics and/or companion diagnostics are subject to regulation by the FDA and similar regulatory authorities outside the United States as medical devices and require separate regulatory approval or clearance prior to commercialization. Given our limited experience in developing diagnostics, we expect to rely in part or in whole on third parties for their design and manufacture. If we are unable to engage a third party to assist us, or if we, or any third parties that we engage, are unable to successfully develop complementary diagnostics and/or companion diagnostics for vopratelimab, JTX-4014, JTX-8064 and other future product candidates, or experience delays in doing so:

- the development of vopratelimab, JTX-4014, JTX-8064 and other future product candidates may be adversely affected if we are unable to appropriately select patients for enrollment in our clinical trials;
- vopratelimab, JTX-4014, JTX-8064 and other future product candidates may not receive marketing approval if safe and effective use of a product candidate depends on complementary diagnostics and/or companion diagnostics and such a diagnostic is not commercially available or otherwise approved or cleared by the appropriate regulatory authority; and
- we may not realize the full commercial potential of vopratelimab, JTX-4014, JTX-8064 and other future product candidates that receive marketing approval if, among other reasons, we are unable to appropriately identify, or it takes us longer to identify, patients who are likely to benefit from therapy with our products, if approved.

If any of these events were to occur, our business would be harmed, possibly materially.

If product liability lawsuits are brought against us, we may incur substantial liabilities.

We face an inherent risk of product liability as a result of the clinical testing of vopratelimab, JTX-4014, JTX-8064 and other future product candidates. For example, we may be sued if our product candidates cause or are perceived to cause injury or are found to be otherwise unsuitable during clinical testing, manufacturing, marketing or sale. Any such product liability claims may include allegations of defects in manufacturing, defects in design, a failure to warn of dangers inherent in the product, negligence, strict liability or a breach of warranties. Claims could also be asserted under state consumer protection acts. If we cannot successfully defend ourselves against product liability claims, we may incur substantial liabilities. Even successful defense would require significant financial and management resources. Regardless of the merits or eventual outcome, liability claims may result in:

- decreased demand for our product candidates;
- injury to our reputation;
- withdrawal of clinical trial participants;
- initiation of investigations by regulators;
- costs to defend the related litigation;
- a diversion of management's time and our resources;
- substantial monetary awards to trial participants or patients;
- product recalls, withdrawals or labeling, marketing or promotional restrictions;
- loss of revenue;
- exhaustion of any available insurance and our capital resources;
- the inability to commercialize any product candidate; and
- a decline in our share price.

Insurance coverage is increasingly expensive. We may not be able to maintain insurance at a reasonable cost or in an amount adequate to satisfy any liability that may arise, if at all. Our insurance policy contains various exclusions, and we may be subject to a product liability claim for which we have no coverage. We may have to pay any amounts awarded by a court or negotiated in a settlement that exceed our coverage limitations or that are not covered by our insurance, and we may not have, or be able to obtain, sufficient capital to pay such amounts. Even if our agreements

with any future corporate collaborators entitle us to indemnification against losses, such indemnification may not be available or adequate should any claim arise.

Adverse events in the field of immuno-oncology could damage public perception of our product candidates and negatively affect our business.

The commercial success of our products will depend in part on public acceptance of the use of cancer immunotherapies. Adverse events in clinical trials of vopratelimab, JTX-4014, JTX-8064, any of our other future product candidates or other similar products and the resulting publicity, as well as any other adverse events in the field of immuno-oncology that may occur, including in connection with competitor therapies such as approved immunotherapy antibodies, the anti-ICOS antibodies of BMS, GlaxoSmithKline plc or Kymab Group Ltd., Xenor, Inc.'s anti-PD-1 and anti-ICOS bispecific antibody or Merck & Co., Inc.'s anti-LILRB2 antibody, could result in a decrease in demand for vopratelimab, JTX-4014, JTX-8064 or other products that we may develop. If public perception is influenced by claims that the use of cancer immunotherapies is unsafe, whether related to our or our competitors' therapies, our products may not be accepted by the general public or the medical community.

Future adverse events in immuno-oncology or the biopharmaceutical industry could also result in greater governmental regulation, stricter labeling requirements and potential regulatory delays in the testing or approvals of our products. Any increased scrutiny could delay or increase the costs of obtaining marketing approval for vopratelimab, JTX-4014, JTX-8064 and other future product candidates.

Healthcare legislative reform measures may have a material adverse effect on our business and results of operations.

In the United States, there have been and continue to be a number of legislative initiatives to contain healthcare costs. For example, in March 2010, the Affordable Care Act was passed, which substantially changes the way health care is financed by both governmental and private insurers, and significantly impacts the U.S. pharmaceutical industry.

We expect that additional state and federal healthcare reform measures will be adopted in the future, any of which could limit the amounts that federal and state governments will pay for healthcare products and services, which could result in reduced demand for our product candidates or complementary diagnostics or companion diagnostics or additional pricing pressures.

For example, with enactment of the Tax Cuts and Jobs Act of 2017, which was signed by the President on December 22, 2017, Congress repealed the "individual mandate." The repeal of this provision, which requires most Americans to carry a minimal level of health insurance, will become effective in 2019. According to the Congressional Budget Office, the repeal of the individual mandate will cause 8.67 million fewer Americans to be insured in 2027 and premiums in insurance markets may rise. Further, each chamber of the Congress has put forth multiple bills designed to repeal or repeal and replace portions of the Affordable Care Act, or ACA. Although none of these measures has been enacted by Congress to date, Congress may consider other legislation to repeal and replace elements of the ACA.

The current administration has also taken executive actions to undermine or delay implementation of the ACA. In January 2017, the President signed an Executive Order directing federal agencies with authorities and responsibilities under the ACA to waive, defer, grant exemptions from, or delay the implementation of any provision of the ACA that would impose a fiscal or regulatory burden on states, individuals, healthcare providers, health insurers, or manufacturers of pharmaceuticals or medical devices. In October 2017, the President signed a second Executive Order allowing for the use of association health plans and short-term health insurance, which may provide fewer health benefits than the plans sold through the ACA exchanges. At the same time, the Administration announced that it will discontinue the payment of cost-sharing reduction, or CSR, payments to insurance companies until Congress approves the appropriation of funds for such CSR payments. The loss of the CSR payments is expected to increase premiums on certain policies issued by qualified health plans under the ACA.

Our future relationships with customers and third-party payors in the United States and elsewhere may be subject, directly or indirectly, to applicable anti-kickback, fraud and abuse, false claims, transparency, health information privacy and security and other healthcare laws and regulations, which could expose us to criminal sanctions, civil penalties, contractual damages, reputational harm, administrative burdens and diminished profits and future earnings.

Our future arrangements with third-party payors and customers may expose us to broadly applicable fraud and abuse and other healthcare laws and regulations. In addition, we may be subject to transparency laws and patient privacy regulation by the U.S. federal and state governments and by governments in foreign jurisdictions in which we conduct our business. The applicable federal, state and foreign healthcare laws and regulations that may affect our ability to operate include the federal Anti-Kickback Statute, the federal Health Insurance Portability and Accountability Act of 1996, or HIPAA, as amended by the Health Information Technology for Economic and Clinical Health Act of 2009, or HITECH, the federal legislation commonly referred to as the Physician Payments Sunshine Act, and analogous state and foreign laws and regulations, any of which may constrain the business or financial arrangements and relationships through which we sell, market and distribute any products for which we obtain marketing approval.

Because of the breadth of these laws and the narrowness of the statutory exceptions and regulatory safe harbors available under such laws, it is possible that some of our business activities could be subject to challenge under one or more of such laws. The scope and enforcement of each of these laws is also uncertain and any investigation or settlement could be time- and resource-consuming, divert management's attention, increase our costs or otherwise have an adverse effect on our business.

If our operations are found to be in violation of any of the laws described above or any other government regulations that apply to us, we may be subject to various significant penalties, any of which could harm our ability to operate our business and our financial results. In addition, the approval and commercialization of our product candidates outside the United States will also likely subject us to foreign equivalents of the healthcare laws mentioned above, among other foreign laws.

Risks Related to our Financial Position and Need for Additional Capital

We have incurred net losses in every year since our inception and anticipate that we will continue to incur substantial net losses in the foreseeable future.

We are a clinical-stage biopharmaceutical company with a limited operating history, and we are early on in our development efforts. Investment in biopharmaceutical product development is highly speculative because it entails substantial upfront capital expenditures and significant risk that any potential product candidate will fail to demonstrate adequate effect or an acceptable safety profile, gain marketing approval and become commercially viable. We have financed our operations primarily through the sale of equity securities and our collaboration with Celgene. Since our inception, most of our resources have been dedicated to the preclinical and clinical development of vopratelimab, JTX-4014, and JTX-8064 and preclinical and planned clinical development of other future product candidates and discovery programs. The size of our future net losses will depend, in part, on our future expenses and our ability to generate additional revenue, if any. We have no products approved for commercial sale and have not generated any revenue from product sales to date, and we continue to incur significant research and development and other expenses related to our ongoing operations. As a result, we have incurred losses in each annual period since our inception. For the years ended December 31, 2018 and 2017, we reported net losses of $27.4 million and $16.4 million, respectively. As of December 31, 2018, we had an accumulated deficit of $163.9 million. We expect to continue to incur significant losses for the foreseeable future, and we expect these losses to increase as we continue our research and development of, and seek marketing approvals for vopratelimab, JTX-4014, JTX-8064 and other future product candidates.

Even if we succeed in receiving marketing approval for and commercialize our product candidate, we will continue to incur substantial research and development and other expenditures to develop and market additional potential products. We may encounter unforeseen expenses, difficulties, complications, delays and other unknown factors that may adversely affect our business. The size of our future net losses will depend, in part, on the rate of future growth of our expenses and our ability to generate revenue. Our prior losses and expected future losses have had and will continue to have an adverse effect on our stockholders' equity and working capital.

We have never generated any revenue from product sales and our ability to generate revenue from product sales and become profitable depends on our success on a number of factors.

We have no products approved for commercial sale, have not generated any revenue from product sales, and do not anticipate generating any revenue from product sales until some time after we have received marketing approval for the commercial sale of a product candidate, if ever. Our ability to generate revenue and achieve profitability depends significantly on our success in many factors, including:

- completing clinical development of vopratelimab and JTX-4014, preclinical and clinical development of JTX-8064, and research, discovery, preclinical and clinical development of other future product candidates;
- obtaining marketing approvals for vopratelimab, JTX-4014, JTX-8064 and other future product candidates for which we complete clinical trials;
- developing a sustainable and scalable manufacturing process for our product candidates, including establishing and maintaining commercially viable supply and manufacturing relationships with third parties;
- launching and commercializing our product candidates for which we obtain marketing approvals, either directly or with a collaborator or distributor;
- obtaining market acceptance of vopratelimab, JTX-4014, JTX-8064 and other future product candidates as viable treatment options;
- addressing any competing technological and market developments;
- identifying, assessing, acquiring and developing new product candidates;
- negotiating favorable terms in any collaboration, licensing, or other arrangements into which we may enter;
- obtaining, maintaining, protecting, and expanding our portfolio of intellectual property rights, including patents, trade secrets and know-how; and
- attracting, hiring and retaining qualified personnel.

Even if our product candidates or other future product candidates that we develop are approved for commercial sale, we anticipate incurring significant costs associated with commercializing any approved product candidate. These costs may fluctuate or exceed our expectations and our revenues will depend on many factors that we cannot control or estimate. If we are not able to generate revenue from the sale of any approved products, we may never become profitable.

We will require substantial additional financing to achieve our goals, and a failure to obtain this necessary capital when needed could force us to delay, limit, reduce or terminate our product development or commercialization efforts.

Our operations have consumed substantial amounts of cash since inception. As of December 31, 2018, our cash, cash equivalents and investments were $195.9 million. We expect to continue to spend substantial amounts to continue the clinical development of vopratelimab and JTX-4014 and preclinical and clinical development of JTX-8064 and other future product candidates. If we are able to gain marketing approval for any of our product candidates, we will require significant additional amounts of cash in order to launch and commercialize those product candidates to the extent that such launch and commercialization are not the responsibility of a collaborator. In addition, other unanticipated costs may arise. Because the design and outcome of our planned and anticipated clinical trials are highly uncertain, we cannot reasonably estimate the actual amounts necessary to successfully complete the development and commercialization of vopratelimab, JTX-4014, JTX-8064 and other future product candidates. Our future capital requirements depend on many factors, including:

- the scope, progress, results and costs of researching and developing our product candidates, and conducting preclinical studies and clinical trials;
- the timing of, and the costs involved in, obtaining marketing approvals for our product candidates if clinical trials are successful;
- the success of our collaboration with Celgene;
- whether Celgene exercises its licensing and co-development options under our Celgene Collaboration Agreement, each of which would trigger additional payments to us;

- the continuation of activities under our Celgene Collaboration Agreement without disruption following the anticipated acquisition of Celgene by BMS;
- the cost of commercialization activities for our product candidates, that are approved for sale, including marketing, sales and distribution costs;
- the cost of manufacturing our product candidates for clinical trials in preparation for marketing approval and in preparation for commercialization;
- our ability to establish and maintain strategic licensing or other arrangements and the financial terms of such agreements;
- the costs involved in preparing, filing, prosecuting, maintaining, expanding, defending and enforcing patent claims, including litigation costs and the outcome of such litigation;
- the timing, receipt, and amount of sales of, or royalties on, our future products, if any;
- the emergence of competing cancer therapies and other adverse market developments; and
- the requirement for and cost of developing complementary diagnostics and/or companion diagnostics.

We do not have any committed external source of funds or other support for our development efforts, other than our collaboration with Celgene, which is limited in scope and duration. We will not receive any option-exercise fees or milestone payments prior to Celgene exercising a licensing or co-development option. Until we can generate sufficient product and royalty revenue to finance our cash requirements, which we may never do, we expect to finance our future cash needs through a combination of public or private equity offerings, debt financings, collaborations, strategic alliances, licensing arrangements and other marketing or distribution arrangements. Based on our research and development plans, we expect that our existing cash, cash equivalents and investments will enable us to fund our operating expenses and capital expenditure requirements for at least the next 24 months.

If we are unable to obtain adequate financing on favorable terms when needed, we may have to delay, reduce the scope of or suspend one or more of our clinical trials or research and development programs or our commercialization efforts.

Raising additional capital may cause dilution to our stockholders, restrict our operations or require us to relinquish rights to our technologies or vopratelimab, JTX-4014, JTX-8064 and other future product candidates.

Until such time, if ever, as we can generate substantial product revenues, we expect to finance our cash needs through a combination of private and public equity offerings, debt financings, collaborations, strategic alliances and licensing arrangements. To the extent that we raise additional capital through the sale of common stock or securities convertible or exchangeable into common stock, stockholders' ownership interest will be diluted, and the terms of these securities may include liquidation or other preferences that adversely affect our stockholders' rights. Debt financing, if available, would increase our fixed payment obligations and 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 are unable to raise additional funds through equity or debt financings when needed, and instead raise additional capital through marketing and distribution agreements or other collaborations, strategic alliances or licensing arrangements with third parties, we may have to relinquish certain valuable rights to vopratelimab, JTX-4014, JTX-8064 and other future product candidates, technologies, future revenue streams or discovery programs or grant licenses on terms that may not be favorable to us.

Risks Related to Intellectual Property

If we are unable to obtain, maintain and protect our intellectual property rights for our product candidates or if our intellectual property rights are inadequate, our competitive position could be harmed.

Our commercial success will depend in part on our ability to obtain and maintain patent and other intellectual property protection in the United States and other countries with respect to our product candidates. We rely on trade secret, patent, copyright and trademark laws, and confidentiality, licensing and other agreements with employees and third parties, all of which offer only limited protection. We currently, or will in the future, seek to protect our proprietary position by filing and prosecuting patent applications in the United States and abroad related to vopratelimab, JTX-4014, JTX-8064, other future product candidates, and any future novel technologies that are important to our business.

The steps we or our licensors have taken to protect our proprietary rights may not be adequate to preclude misappropriation of our proprietary information or infringement of our intellectual property rights, both inside and outside of the United States.

If we or our licensors are unable to obtain and maintain patent protection for vopratelimab, JTX-4014, JTX-8064 or other future product candidates, or if the scope of the patent protection obtained is not sufficient, our competitors could develop and commercialize products similar or superior to ours, and our ability to successfully commercialize vopratelimab, JTX-4014, JTX-8064 and other future product candidates and future technologies may be adversely affected.

Our pending applications cannot be enforced against third parties unless and until a patent issues from such applications and, even after issuance, such patents may be challenged in the courts or patent offices in the United States and abroad. Such proceedings may result in the loss of patent protection, the narrowing of claims in such patents or the invalidity or unenforceability of such patents, which could limit our ability to stop others from using or commercializing similar or identical products or limit the duration of the patent protection for vopratelimab, JTX-4014, JTX-8064 and other future product candidates. In addition, we cannot predict whether any of our future patent applications will result in the issuance of patents that effectively protect vopratelimab, JTX-4014, JTX-8064 and other future product candidates, or if any of our issued patents or if any of our licensor's issued patents will effectively prevent others from commercializing competitive products. In some cases, it may be difficult or impossible to detect third-party infringement or misappropriation of our intellectual property rights, even in relation to issued patent claims, and proving any such infringement may be even more difficult. If we are unable to obtain, maintain, and protect our intellectual property our competitive advantage could be harmed, and it could result in a material adverse effect on our business, financial condition, and the results of operations and prospects.

Patent terms may be inadequate to protect our competitive position on our products for an adequate amount of time, and vopratelimab, JTX-4014, JTX-8064 and other future product candidates for which we intend to seek approval as biologic products may face competition sooner than anticipated.

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 expect to seek patent term extensions of patent terms in the United States for our issued patents, licensed patents and any patents we own in the future and, if available, in other countries where that may be available when we are prosecuting patents. In the United States, the Drug Price Competition and Patent Term Restoration Act of 1984 permits a patent term extension of up to five years beyond the normal expiration of the patent, which is limited to the approved indication. However, the applicable authorities, including the FDA and the United States Patent and Trademark Office, or USPTO, in the United States, and any equivalent regulatory authority in other countries, may not agree with our assessment of whether such extensions are available, and may refuse to grant extensions to our patents, or may grant more limited extensions than we request. We may not be granted an extension because of, for example, failure to exercise due diligence during the testing phase or regulatory review process, failure to apply within applicable deadlines, failure to apply prior to expiration of relevant patents or otherwise failing to satisfy applicable requirements. If we are unable to obtain patent term extension or the term of any such extension is less than we request, our competitors may be able to take advantage of our investment in development and clinical trials by referencing our clinical and preclinical data and launch their product earlier than might otherwise be the case, which could result in a material adverse effect on our business, financial condition, results of operation and prospects.

The Biologics Price Competition and Innovation Act of 2009, or BPCIA, established legal authority for the FDA to review and approve biosimilar biologics, including the possible designation of a biosimilar as "interchangeable" based on its similarity to an existing brand product. Under the BPCIA, an application for a biosimilar product cannot be approved by the FDA until 12 years after the original branded product was approved under a BLA. The law is complex and is still being interpreted and implemented by the FDA. As a result, its ultimate impact, implementation, and meaning are subject to uncertainty. While it is uncertain when such processes intended to implement BPCIA may be fully adopted by the FDA, any such processes could have a material adverse effect on the future commercial prospects for our biological products.

We intend to seek market exclusivity for our biological product candidates that is subject to its own BLA for 12 years in the United States, 10 years in Europe and other durations in other markets. However, the term of the patents that cover such product candidates may not extend beyond the applicable market exclusivity awarded by a particular country. For example, in the United States, if all of the patents that cover our particular biologic product expire before the 12-year market exclusivity expires, a third party could submit a marketing application for a biosimilar product four years after approval of our biologic product, and the FDA could immediately review the application and approve the biosimilar product for marketing 12 years after approval of our biologic. Alternatively, a third party could submit a BLA

for a similar or identical product any time after approval of our biologic product, and the FDA could immediately review and approve the similar or identical product for marketing and the third party could begin marketing the similar or identical product upon expiry of all of the patents that cover our particular biologic product.

Additionally, there is a risk that this exclusivity could be shortened due to congressional action, potentially creating the opportunity for biosimilar competition sooner than anticipated. The extent to which a biosimilar, once approved, will be substituted for any one of our reference products in a way that is similar to traditional generic substitution for non-biological products is not yet clear, and will depend on a number of marketplace and regulatory factors that are still developing.

If we are unable to protect the confidentiality of our proprietary information and know-how, the value of our technology and products could be adversely affected.

In addition to seeking patent protection, we also rely on other proprietary rights, including protection of trade secrets, know-how and confidential and proprietary information. To maintain the confidentiality of our trade secrets and proprietary information, we enter into confidentiality agreements with our employees, consultants, collaborators and other third parties who have access to our trade secrets. These agreements require that all confidential information developed by the individual or made known to the individual by us during the course of the individual's relationship with us be kept confidential and not disclosed to third parties. Our agreements with employees also provide that any inventions conceived by the individual in the course of rendering services to us shall be our exclusive property. However, we may not obtain these agreements in all circumstances, and individuals with whom we have these agreements may not comply with their terms. The assignment of intellectual property rights may not be self-executing or the assignment agreements may be breached, and we may be forced to bring claims against third parties, or defend claims that they may bring against us, to determine the ownership of what we regard as our intellectual property. In addition, in the event of unauthorized use or disclosure of our trade secrets or proprietary information, these agreements, even if obtained, may not provide meaningful protection, particularly for our trade secrets or other confidential information.

Adequate remedies may not exist in the event of unauthorized use or disclosure of our confidential information. 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 are less willing or unwilling to protect trade secrets. The disclosure of our trade secrets or the independent development of our trade secrets by a competitor or other third party would impair our competitive position and may materially harm our business, financial condition, results of operations and prospects.

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

Our commercial success depends on our ability and the ability of our current or future collaborators to develop, manufacture, market and sell our product candidates, and to use our related proprietary technologies without infringing, misappropriating or otherwise violating the intellectual property and proprietary rights of third parties. The biotechnology and pharmaceutical industries are characterized by extensive litigation regarding patents and other intellectual property rights. We may become party to, or threatened with, adversarial proceedings or litigation regarding intellectual property rights with respect to our current and future product candidates. For example, we are aware of third-party patents generally directed to methods of treating certain indications with an anti-PD-1 monoclonal antibody and/or an anti-ICOS monoclonal antibody that may be construed to cover one or more of our current and future product candidates. If we are found to infringe a third-party's intellectual property rights, and we are unsuccessful in demonstrating that such intellectual property rights are invalid or unenforceable, we could be required to obtain a license from such third party to continue developing, manufacturing and commercializing our product candidates. 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 and other third parties access to the same technologies licensed to us, and it could require us to make substantial licensing and royalty payments. We also could be forced, including by court order, to cease developing, manufacturing, and commercializing our product candidates. In addition, in any such proceeding or litigation, we could be found liable for significant monetary damages, including treble damages and attorneys' fees, if we are found to have willfully infringed a patent or other intellectual property right. Any of the foregoing could have a material adverse effect on our business, financial condition, results of operations and prospects.

In addition, we are testing vopratelimab and JTX-4014 and expect to test JTX-8064 and future product candidates with other products that are covered by patents held by other companies or institutions. In the event that a labeling instruction is required in product packaging recommending that combination, we could be accused of, or held liable for, infringement of the third-party patents covering the product candidate or product recommended for administration with our product candidates. In such a case, we could be required to obtain a license from the other company or

institution to use the required or desired package labeling, which may not be available on commercially reasonable terms, or at all.

If we breach any of our license agreements or collaboration agreements, it could have a material adverse effect on our commercialization efforts for our product candidates.

Our commercial success depends on our ability, and at times, the ability of our licensors and current or future collaborators to develop, manufacture, market, and sell our product candidates, and use our licensors proprietary technologies without infringing the property rights of third parties. For example, we have entered into our Celgene Collaboration Agreement relating to vopratelimab, JTX-4014, JTX-8064 and other product candidates, and an exclusive license agreement with Sloan Kettering Institute for Cancer Research, Memorial Sloan Kettering Cancer Center and Memorial Hospital for Cancer and The University of Texas MD Anderson Cancer Center related to certain uses of our vopratelimab, and we may enter into additional licenses in the future. These and other licenses may not provide exclusive rights to use such intellectual property and technology in all relevant fields of use and in all territories in which we may wish to develop or commercialize our products in the future. As a result, we may not be able to prevent competitors from developing and commercializing competitive products in territories included in all our licenses.

In addition, we may not have the right to control the preparation, filing, prosecution, maintenance, enforcement and defense of patents and patent applications covering the technology that we license from third parties. For example, under our Celgene Collaboration Agreement, under certain circumstances, Celgene has the first right to enforce, maintain or defend our intellectual property rights with respect to certain licensed programs. Therefore, we cannot be certain that these patents and patent applications will be prepared, filed, prosecuted, maintained, enforced, and defended in a manner consistent with the best interests of our business. If our licensors fail to prosecute, maintain, enforce and defend such patents, or lose rights to those patents or patent applications, the rights we have licensed may be reduced or eliminated and our right to develop and commercialize our product candidates that are the subject of such licensed rights could be adversely affected. Furthermore, our owned and in-licensed patents may be subject to a reservation of rights by one or more third parties.

Certain of our license agreements also require us to meet development thresholds to maintain the license, including establishing a set timeline for developing and commercializing products. If we fail to comply with the obligations under our license agreements, including payment and diligence terms, our licensors may have the right to terminate our agreements. Such an occurrence could materially adversely affect the value of the product candidate being developed under any such agreement. Termination of our license agreements or reduction or elimination of our rights under them may result in our having to negotiate a new or reinstated agreement, which may not be available to us on equally favorable terms, or at all.

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, which could have a material adverse effect on our business, financial conditions, results of operations and prospects.

Further, 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.

We may not be successful in obtaining necessary rights to our product candidates we may develop or obtain through acquisitions and in-licenses.

We currently have rights to intellectual property, through licenses from third parties, for certain uses of vopratelimab. Because vopratelimab, JTX-4014, JTX-8064 and other future product candidates may require the use of proprietary rights held by third parties, the growth of our business likely will depend, in part, on our ability to acquire, in-license or use these proprietary rights. We may be unable to acquire or in-license any compositions, methods of use, processes or other intellectual property rights from third parties that we identify as necessary for vopratelimab, JTX-4014, JTX-8064 and other future product candidates. The licensing or acquisition of third-party intellectual property rights is a competitive area, and several more established companies may pursue strategies to license or acquire third-party intellectual property rights that we may consider attractive. These established companies may have a competitive advantage over us due to their size, capital resources and greater clinical development and commercialization capabilities.

If we are unable to successfully obtain required third-party intellectual property rights or maintain the existing intellectual property rights we have, we may have to abandon or alter our plans for the development or commercialization of the

relevant program or product candidate, which could have a material adverse effect on our business, financial condition, results of operations and prospects.

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

Filing, prosecuting and defending patents on vopratelimab, JTX-4014, JTX-8064 and all other future product candidates throughout the world would be prohibitively expensive, and intellectual property rights in some countries outside the United States can be less extensive than those in the United States.

Many companies have encountered significant problems in protecting and defending intellectual property rights in certain foreign jurisdictions. Any efforts to enforce our intellectual property and proprietary rights around the world may be inadequate to obtain a significant commercial advantage from the intellectual property we develop or license.

Moreover, many countries have compulsory licensing laws under which a patent owner may be compelled to grant licenses to third parties. If we or any of our licensors is forced to grant a license to third parties with respect to any patents relevant to our business, our competitive position may be impaired, and our business and results of operations may be adversely affected.

Generic or biosimilar product manufacturers may develop, seek approval for, and launch biosimilar versions or generic versions, respectively, of our products. The FDA has published draft guidance documents on biosimilar product development. For the FDA to approve a biosimilar product as interchangeable with a reference product, the agency must find that the biosimilar product can be expected to produce the same clinical results as the reference product and, for products administered multiple times, the biosimilar 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. If vopratelimab, JTX-4014, JTX-8064 and other future product candidates are approved by the FDA, the approval of a biosimilar product to one of our products could have a material impact on our business. In particular, a biosimilar product could be significantly less costly to bring to market and priced significantly lower than our products, if approved by the FDA.

Obtaining and maintaining patent protection depends on compliance with various procedural, document submission, 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.

The USPTO and various foreign governmental patent agencies require compliance with a number of procedural, documentary, fee payments and other similar provisions during the patent application process and to maintain patents after they are issued. In certain circumstances, we rely on our licensing partners to take the necessary action to comply with these requirements with respect to our licensed intellectual property. While an unintentional lapse can 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. If we fail to obtain and maintain the patents and patent applications covering our products or procedures, we may not be able to stop a competitor from marketing products that are the same as or similar to vopratelimab, JTX-4014, JTX-8064 and other future product candidates, which would have a material adverse effect on our business.

Changes to the 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.

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. Changes in patent law 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.

We may become involved in lawsuits to protect or enforce our intellectual property, which could be expensive, time-consuming and unsuccessful and have a material adverse effect on the success of our business.

Competitors may infringe our licensed patents or any patent we own in the future or misappropriate or otherwise violate our intellectual property rights. We may also be required to defend against claims of infringement and our licensed patents and any patents we own in the future may become involved in priority or other intellectual property related disputes. To counter infringement or unauthorized use, litigation may be necessary to enforce or defend our intellectual property rights or to determine the validity and scope of our own intellectual property rights or the proprietary rights of others. Also, third parties may initiate legal proceedings against us or our licensors to assert that we are infringing their intellectual property rights or to challenge the validity or scope of our owned or licensed intellectual property rights. Litigation and other intellectual property related proceedings could result in substantial costs and diversion of management resources, which could harm our business and financial results. Despite our best efforts, we may not be able to prevent third parties from infringing upon or misappropriating our intellectual property. In addition, an adverse result in any litigation or other intellectual property related proceeding could put one or more of our patents at risk of being invalidated, held unenforceable or interpreted narrowly.

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 disclosed during this type of litigation. There could also be public announcements of the results of hearings, motions or other interim proceedings or developments in any such proceedings. If securities analysts or investors perceive these results to be negative, it also could have a material adverse effect on the price of shares of our common stock. Any of the foregoing may have a material adverse effect on our business, financial condition, results of operations and prospects.

We may be subject to claims by third parties asserting that our collaborators, licensors, employees or we have misappropriated their intellectual property, have wrongfully used or disclosed confidential information of third parties or are in breach of non-competition or non-solicitation agreements with our competitors.

Many of our employees, our collaborators' employees and our licensors' employees, including our senior management, are currently or previously were employed at universities or other biotechnology or pharmaceutical companies, including our competitors or potential competitors. Some of these employees, including each member of our senior management, executed proprietary rights, non-disclosure and non-competition agreements, or similar agreements, in connection with such previous employment. Although we try to ensure that our employees do not use the proprietary information or know-how of others in their work for us, we may be subject to claims that we or these employees have used or disclosed intellectual property of any such individual's current or former employer. In addition, we could 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, 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. Litigation may be necessary to defend against such claims. If we fail in defending any such claims, we may lose valuable intellectual property rights or personnel or sustain monetary damages. Even if we are successful in defending against such claims, litigation could result in substantial costs and be a distraction to management. Any of the foregoing may have a material adverse effect on our business, financial condition, results of operations and prospects.

Issued patents covering vopratelimab, JTX-4014, JTX-8064 and other future product candidates could be found invalid or unenforceable if challenged in court or before the USPTO or comparable foreign authority.

If we or one of our licensing partners initiate legal proceedings against a third party to enforce a patent covering one of vopratelimab, JTX-4014, JTX-8064 or other future product candidates, the defendant could counterclaim that the patent covering our product candidate is invalid or unenforceable. The outcome following legal assertions of invalidity and unenforceability is unpredictable. If a third party were to prevail on a legal assertion of invalidity and/or unenforceability, we would lose at least part, and perhaps all, of the patent protection on vopratelimab, JTX-4014, JTX-8064 and other future product candidates. Such a loss of patent protection could have a material adverse impact on our business.

Risks Related to Employee Matters, Managing our Growth and Other Risks Related to our Business

We currently have no marketing and sales organization and have no experience in marketing products. If we are unable to establish marketing and sales capabilities or enter into agreements with third parties to market and sell our product candidates, we may not be able to generate product revenue.

We currently have no sales, marketing, or distribution capabilities and have no experience in marketing products. If any of our product candidates receives appropriate regulatory approval, we intend to develop an in-house marketing organization and sales force, which will require significant capital expenditures, management resources and time. We will have to compete with other pharmaceutical and biotechnology companies to recruit, hire, train and retain marketing and sales personnel.

If we are unable or decide not to establish internal sales, marketing and distribution capabilities, we will pursue collaborative arrangements regarding the sales and marketing of our products; however, we cannot assure stockholders that we will be able to establish or maintain such collaborative arrangements, on favorable terms if at all. We cannot assure stockholders that we will be able to develop in-house sales and distribution capabilities or establish or maintain relationships with third-party collaborators to commercialize any current or future product candidates.

We will need to grow the size of our organization, and we may experience difficulties in managing this growth.

As of December 31, 2018, we had 115 full-time employees, including 86 employees engaged in research and development. As our development and commercialization plans and strategies develop, we expect to need additional managerial, operational, sales, marketing, financial and other personnel. Future growth would impose significant added responsibilities on members of management, including:

- identifying, recruiting, integrating, maintaining and motivating additional employees;
- managing our internal development efforts effectively, including the clinical and FDA review process for vopratelimab, JTX-4014, JTX-8064 and other future product candidates, while complying with our contractual obligations to contractors and other third parties; and
- improving our operational, financial and management controls, reporting systems and procedures.

Our future financial performance and our ability to commercialize vopratelimab, JTX-4014, JTX-8064 and other future product candidates will depend, in part, on our ability to effectively expand our organization by hiring new employees and expand our groups of consultants and contractors and manage any future growth, and our management may also have to divert 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 independent organizations, advisors and consultants to provide certain services, including substantially all aspects of marketing approval, clinical management, and manufacturing. We cannot assure stockholders that we can effectively manage our outsourced activities.

We are highly dependent on our key personnel, and if we are not successful in attracting, motivating and retaining highly qualified personnel, we may not be able to successfully implement our business strategy.

Our ability to compete in the highly competitive biotechnology and pharmaceutical industries depends upon our ability to attract, motivate and retain highly qualified managerial, scientific and medical personnel. We are highly dependent on our management, particularly our chief executive officer, Richard Murray, and our scientific and medical personnel. The loss of the services of any of our executive officers, key employees, and scientific and medical advisors, and our inability to find suitable replacements, could result in delays in product development and harm our business.

We conduct our operations at our facility in Cambridge, Massachusetts, in a region that is home to many other biopharmaceutical companies and many academic and research institutions. Competition for skilled personnel is intense and the turnover rate can be high, which may limit our ability to hire and retain highly qualified personnel on acceptable terms or at all. We expect that we will need to recruit talent from outside of our region and doing so may be costly and difficult.

To induce valuable employees to remain at our Company, in addition to salary and cash incentives, we have provided equity awards that vest over time. The value to employees of these equity grants that vest over time may be significantly affected by movements in our stock price that are beyond our control and may at any time be insufficient to counteract more lucrative offers from other companies. Although we have employment agreements with our key employees, these employment agreements provide for at-will employment, meaning that such employees could leave our employment

at any time, with or without notice. We do not maintain “key man” insurance policies on the lives of all of these individuals or the lives of any of our other employees.

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 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. Our operations involve the use of hazardous and flammable materials, including chemicals and biological and radioactive materials. 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. In the event of contamination or injury resulting from our use of hazardous materials, we could be held liable for any resulting damages, 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.

Our internal computer systems, or those used by our CROs or other collaborators, may fail or suffer security breaches and cyber-attacks, which could compromise our intellectual property or other sensitive information and could result in a material disruption of our business.

Despite the implementation of security measures, our internal computer systems are vulnerable to damage from computer viruses and unauthorized access. While we have not to our knowledge experienced any such material system failure or security breach to date, if such an event were to occur, it could result in a material disruption of our business operations. Likewise, we rely on third parties for many aspects of our business, including manufacturing product candidates and conducting clinical trials. The secure maintenance of this information is critical to our business and reputation. We believe that companies have been increasingly subject to a wide variety of security incidents, cyber-attacks and other attempts to gain unauthorized access. These threats can come from a variety of sources, ranging in sophistication from an individual hacker to a state-sponsored attack. Cyber threats may be generic, or they may be custom-crafted against our information systems. Over the past few years, cyber-attacks have become more prevalent and much harder to detect and defend against.

Our network and storage applications and those of our CROs, collaborators and vendors may be subject to unauthorized access by hackers or breached due to operator error, malfeasance or other system disruptions. It is often difficult to anticipate or immediately detect such incidents and the damage caused by them. These data breaches and any unauthorized access or disclosure of our information or intellectual property could compromise our intellectual property and expose sensitive business information. A data security breach could also lead to public exposure of personal information of our employees. Cyber-attacks could cause us to incur significant remediation costs, disrupt key business operations and divert attention of management and key information technology resources. Our network security and data recovery measures and those of our CROs, collaborators and vendors may not be adequate to protect against such security breaches and disruptions. To the extent that any disruption, security breach or cyber-attack 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 the further development and commercialization of our product candidates could be delayed.

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

Natural disasters could severely disrupt our operations and have a material adverse effect on our business. If a natural disaster, power outage or other event occurred that damaged critical infrastructure, such as our headquarters or the manufacturing facilities of our third-party contract manufacturers, or that otherwise disrupted operations, it may be difficult or, in certain cases, impossible for us to continue our business for a substantial period of time. The disaster recovery and business continuity plans we have in place may prove inadequate in the event of a serious disaster or similar event. We may incur substantial expenses as a result of the limited nature of our disaster recovery and business continuity plans, which, could have a material adverse effect on our business.

Our employees, independent contractors, vendors, principal investigators, CROs and consultants 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 that our employees, independent contractors, vendors, principal investigators, CROs and consultants may engage in fraudulent conduct or other illegal activity. Misconduct by these parties could include intentional, reckless and/or negligent conduct or disclosure of unauthorized activities to us that violate the regulations of the FDA and comparable foreign regulatory authorities, including those laws requiring the reporting of true, complete and accurate information to such authorities; healthcare fraud and abuse laws and regulations in the United States and abroad; or laws that require the reporting of financial information or data accurately. In particular, sales, marketing and business arrangements in the healthcare industry are subject to extensive laws and regulations intended to prevent fraud, misconduct, kickbacks, self-dealing and other abusive practices. We have adopted a code of conduct applicable to all of our employees, but it is not always possible to identify and deter misconduct, and the precautions we take to detect and prevent this activity may not be effective in controlling unknown or unmanaged risks or losses or in protecting us from governmental investigations or other actions or lawsuits stemming from a failure to comply with these laws or regulations. Additionally, we are subject to the risk that a person could allege such fraud or other misconduct, even if none occurred. If any such actions are instituted against us, and we are not successful in defending ourselves or asserting our rights, those actions could result in significant penalties and could have a material adverse effect on our ability to operate our business and our results of operations.

If we engage in future acquisitions or strategic partnerships, this may increase our capital requirements, dilute our stockholders, cause us to incur debt or assume contingent liabilities, and subject us to other risks.

We may evaluate various acquisitions and additional strategic partnerships, including licensing or acquiring complementary products, intellectual property rights, technologies, or businesses. Any potential acquisition or strategic partnership may entail numerous risks, including:

- increased operating expenses and cash requirements;
- the assumption of additional indebtedness or contingent liabilities;
- the issuance of our equity securities;
- assimilation of operations, intellectual property and products of an acquired company, including difficulties associated with integrating new personnel;
- the diversion of our management's attention from our existing product programs and initiatives in pursuing such a strategic merger or acquisition;
- retention of key employees, the loss of key personnel, and uncertainties in our ability to maintain key business relationships;
- risks and uncertainties associated with the other party to such a transaction, including the prospects of that party and their existing products or product candidates and marketing approvals; and
- our inability to generate revenue from acquired technology and/or products sufficient to meet our objectives in undertaking the acquisition or even to offset the associated acquisition and maintenance costs.

In addition, if we undertake acquisitions, we may issue dilutive securities, assume or incur debt obligations, incur large one-time expenses and acquire intangible assets that could result in significant future amortization expense. Moreover, we may not be able to locate suitable acquisition opportunities and this inability could impair our ability to grow or obtain access to technology or products that may be important to the development of our business.

Unstable market and economic conditions may have serious adverse consequences on our business, financial condition and stock price.

Our general business strategy may be adversely affected by any economic downturn, volatile business environment or unpredictable and unstable conditions in global credit and financial markets. We cannot assure stockholders that deterioration of the global credit and financial markets would not negatively impact our stock price, our current portfolio of cash equivalents or investments, or our ability to meet our financing objectives. If the current equity and credit markets deteriorate, it may make any necessary debt or equity financing more difficult, more costly, and more dilutive. Failure to secure any necessary financing in a timely manner and on favorable terms could have a material adverse effect on our growth strategy, financial performance and stock price and could require us to delay or abandon clinical development plans.

Risks Related to our Common Stock

Our ability to utilize our net operating loss carryforwards and certain other tax attributes has been limited by "ownership changes" and may be further limited.

Under Section 382 of the Internal Revenue Code of 1986, as amended, or the IRC, if a corporation undergoes an "ownership change" (generally defined as a greater than 50 percent change (by value) in the ownership of its equity over a three-year period), the corporation's ability to use its pre-change net operating loss, or NOL, carryforwards and certain other pre-change tax attributes to offset its post-change income may be limited. An IRC Section 382 study, completed in August 2016, identified three previous ownership changes for purposes of IRC Section 382. As a result of these ownership changes, our net operating loss and tax credit carryforwards allocable to the periods preceding each such ownership change are subject to limitations under IRC Section 382. We may experience ownership changes in the future as a result subsequent shifts in our stock ownership, some of which are outside our control, which may also be subject to limitations by "ownership changes" in the future, which could result in increased tax liability to us.

The price of our common stock may be volatile and fluctuate substantially, which could result in substantial losses for purchasers of our common stock.

Our stock price is likely to be volatile. The stock market in general and the market for biopharmaceutical companies in particular have experienced extreme volatility that has often been unrelated to the operating performance of particular companies. The market price for our common stock may be influenced by many factors, including:

- the success of competitive products or technologies;
- results of our clinical trials or those of our competitors;
- regulatory or legal developments in the United States and other countries;
- developments or disputes concerning patent applications, issued patents or other proprietary rights;
- the recruitment or departure of key personnel;
- the level of expenses related to our product candidates or clinical development programs;
- the success of our collaboration with Celgene and, if the transaction with BMS is completed, our ability to maintain the collaboration with BMS;
- the results of our efforts to discover, develop, acquire or in-license additional product candidates or drugs;
- actual or anticipated changes in estimates as to financial results, development timelines or recommendations by securities analysts;
- variations in our financial results or those of companies that are perceived to be similar to us;
- changes in the structure of healthcare payment systems;
- market conditions in the pharmaceutical and biotechnology sectors;
- general economic, industry and market conditions; and
- the other factors described in this "Risk Factors" section.

We do not intend to pay dividends on our common stock so any returns will be limited to the value of our stock.

We currently anticipate that we will retain future earnings for the development, operation and expansion of our business and do not anticipate declaring or paying any cash dividends for the foreseeable future. Any return to stockholders will therefore be limited to the appreciation of their stock.

Our executive officers, directors, principal stockholders and their affiliates will continue to exercise control over our Company, which will limit your ability to influence corporate matters and could delay or prevent a change in corporate control.

As of December 31, 2018, our executive officers and directors, combined with our stockholders who owned more than five percent of our outstanding common stock, and their affiliates, beneficially owned approximately 54 percent of our outstanding common stock. As a result, these stockholders, if they act together, will be able to control the outcome of matters submitted to our stockholders for approval, including the election of directors and any sale, merger,

consolidation, or sale of all or substantially all of our assets. In addition, this concentration of ownership might adversely affect the market price of our common stock by:

- delaying, deferring or preventing a change of control;
- impeding a merger, consolidation, takeover or other business combination; or
- discouraging a potential acquiror from making a tender offer or otherwise attempting to obtain control.

We are incurring and will continue to incur significantly increased costs as a result of operating as a public company, and our management is now required to devote substantial time to new compliance initiatives.

As a public company, we are incurring and will continue to incur significant legal, accounting and other expenses, particularly after we are no longer an emerging growth company. We are subject to the reporting requirements of the Exchange Act, as well as various requirements imposed by the Sarbanes-Oxley Act, rules subsequently adopted by the SEC and Nasdaq to implement provisions of the Sarbanes-Oxley Act, and the Dodd-Frank Wall Street Reform and Consumer Protection Act. Stockholder activism, the current political environment and the current high level of government intervention and regulatory reform may lead to substantial new regulations and disclosure obligations, which may lead to additional compliance costs and impact the manner in which we operate our business in ways we cannot currently anticipate.

We expect the rules and regulations applicable to public companies to substantially increase our legal and financial compliance costs and to make some activities more time-consuming and more costly. For example, we expect these rules and regulations to make it more difficult and more expensive for us to obtain director and officer liability insurance and we may be required to incur substantial costs to maintain the same or similar coverage. We also expect that we will need to hire additional accounting, finance and other personnel in connection with our efforts to comply with the requirements of being a public company, and our management and other personnel will need to devote a substantial amount of time towards maintaining compliance with these requirements. We cannot predict or estimate the amount or timing of additional costs we may incur to respond to these requirements. The impact of these requirements could also make it more difficult for us to attract and retain qualified persons to serve on our board of directors, our board committees or as executive officers.

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

We are considered a "smaller reporting company" under Rule 12b-2 of the Exchange Act. We are therefore entitled to rely on certain reduced disclosure requirements, such as an exemption from providing selected financial data and executive compensation information. These exemptions and reduced disclosures in our SEC filings due to our status as a smaller reporting company also mean our auditors are not required to review our internal control over financial reporting and may make it harder for investors to analyze our results of operations and financial prospects. We cannot predict if investors will find our common stock less attractive because we may 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 common stock prices may be more volatile. We will remain a smaller reporting company until our public float exceeds $250 million or our annual revenues exceed $100 million with a public float greater than $700 million.

Sales of a substantial number of shares of our common stock in the public market could cause our stock price to fall.

Certain stockholders hold a substantial number of shares of our common stock. If such stockholders sell, or indicate an intention to sell, substantial amounts of our common stock in the public market, the trading price of our common stock could decline.

In addition, shares of common stock that are either subject to outstanding options or reserved for future issuance under our stock incentive plans will become eligible for sale in the public market extent permitted by the provisions of various vesting schedules and Rule 144 and Rule 701 under the Securities Act of 1933, as amended, or the Securities Act, and, in any event, we have filed a registration statement permitting shares of common stock issued on exercise of options to be freely sold in the public market. If these additional shares of common stock are sold, or if it is perceived that they will be sold, in the public market, the trading price of our common stock could decline.

Certain holders of our common stock are entitled to rights with respect to the registration of their shares under the Securities Act. Registration of these shares under the Securities Act would result in the shares becoming freely tradable without restriction under the Securities Act, except for shares held by affiliates. Any sales of securities by these

stockholders who have exercised registration rights could have a material adverse effect on the trading price of our common stock.

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

Our quarterly and annual operating results may fluctuate significantly, which makes it difficult for us to predict our future operating results. From time to time, we may enter into license or collaboration agreements with other companies that include development funding and significant upfront and milestone payments and/or royalties, which may become an important source of our revenue. Accordingly, our revenue may depend on development funding and the achievement of development and clinical milestones under current and any potential future license and collaboration agreements and sales of our products, if approved. These upfront and milestone payments may vary significantly from period to period and any such variance could cause a significant fluctuation in our operating results from one period to the next.

Furthermore, our operating results may fluctuate due to a variety of other factors, many of which are outside of our control and may be difficult to predict, including the following:

- the timing and cost of, and level of investment in, research and development activities relating to our current and other future product candidates, which will change from time to time;
- our ability to enroll patients in clinical trials and the timing of enrollment;
- the cost of manufacturing our current and other future product candidates, which may vary depending on FDA guidelines and requirements, the quantity of production and the terms of our agreements with manufacturers;
- expenditures that we will or may incur to acquire or develop additional product candidates and technologies;
- the timing and outcomes of clinical trials for vopratelimab, JTX-4014, JTX-8064 and other future product candidates or competing product candidates;
- competition from existing and future products that may compete with vopratelimab, JTX-4014, JTX-8064 and other future product candidates, and changes in the competitive landscape of our industry, including consolidation among our competitors or partners;
- any delays in regulatory review or approval of vopratelimab, JTX-4014, JTX-8064 or other future product candidates;
- the level of demand for vopratelimab, JTX-4014, JTX-8064 and other future product candidates, if approved, which may fluctuate significantly and be difficult to predict;
- our ability to commercialize vopratelimab, JTX-4014, JTX-8064 and other future product candidates, if approved;
- the success of our collaboration with Celgene and our ability to establish and maintain other collaborations, licensing or other arrangements;
- our ability to adequately support future growth;
- potential unforeseen business disruptions that increase our costs or expenses;
- future accounting pronouncements or changes in our accounting policies; and
- the changing and volatile global economic environment.

The cumulative effect of these factors could result in large fluctuations and unpredictability in our quarterly and annual operating results. As a result, comparing our operating results on a period-to-period basis may not be meaningful. Investors should not rely on our past results as an indication of our future performance. If our revenue or operating results fall below the expectations of analysts or investors or below any forecasts we may provide to the market, or if the forecasts we provide to the market are below the expectations of analysts or investors, the price of our common stock could decline substantially. Such a stock price decline could occur even when we have met any previously publicly stated revenue and/or earnings guidance we may provide.

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

If securities analysts do not publish research or reports about our business or if they publish negative evaluations of our stock, the price of our stock could decline.

The trading market for our common stock will rely, in part, on the research and reports that industry or financial analysts publish about us or our business. If one or more of the analysts covering our business downgrade their evaluations of our stock, the price of our stock could decline. If one or more of these analysts cease to cover our stock, we could lose visibility in the market for our stock, which, in turn, could cause our stock price to decline.

Anti-takeover provisions in our charter documents and under Delaware law could make an acquisition of us, which may be beneficial to our stockholders, more difficult and may prevent attempts by our stockholders to replace or remove our current management.

Provisions in our amended and restated certificate of incorporation and amended and restated bylaws may delay or prevent an acquisition of us or a change in our management. These provisions include a classified board of directors, a prohibition on actions by written consent of our stockholders and the ability of our board of directors to issue preferred stock without stockholder approval. In addition, because we are incorporated in Delaware, we are governed by the provisions of Section 203 of the Delaware General Corporation Law, which limits the ability of stockholders owning in excess of 15 percent of our outstanding voting stock to merge or combine with us. Although we believe these provisions collectively provide for an opportunity to obtain greater value for stockholders by requiring potential acquirors to negotiate with our board of directors, they would apply even if an offer rejected by our board were considered beneficial by some stockholders. In addition, these provisions may frustrate or prevent any attempts by our stockholders to replace or remove our current management by making it more difficult for stockholders to replace members of our board of directors, which is responsible for appointing the members of our management.

Our bylaws designate the Court of Chancery of the State of Delaware as the sole and exclusive forum for certain types of actions and proceedings that may be initiated by 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 bylaws, provide that, unless we consent in writing to an alternative forum, the Court of Chancery of the State of Delaware will be the sole and exclusive forum for (i) any derivative action or proceeding brought on our behalf, (ii) any action asserting a claim of breach of a fiduciary duty owed by any of our directors, officers and employees to us or our stockholders, (iii) any action asserting a claim arising pursuant to any provision of the Delaware General Corporation Law, our certificate of incorporation or our bylaws, or (iv) any action asserting a claim that is governed by the internal affairs doctrine, in each case subject to the Court of Chancery having personal jurisdiction over the indispensable parties named as defendants therein. Any person purchasing or otherwise acquiring any interest in any shares of our capital stock shall be deemed to have notice of and to have consented to this provision of our bylaws. 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 employees, which may discourage such lawsuits against us and our directors, officers and employees even though an action, if successful, might benefit our stockholders. Stockholders who do bring a claim in the Court of Chancery could face additional litigation costs in pursuing any such claim, particularly if they do not reside in or near the State of Delaware. The Court of Chancery may also reach different judgments or results than would other courts, including courts where a stockholder considering an action may be located or would otherwise choose to bring the action, and such judgments or results may be more favorable to us than to our stockholders. Alternatively, if a court were to find this provision of our amended and restated certificate of incorporation inapplicable to, or unenforceable in respect of, one or more of the specified types of actions or proceedings, we may incur additional costs, which could have a material adverse effect on our business, financial condition or results of operations.

Item 1B. Unresolved Staff Comments

Not applicable.

Item 2. Properties

We lease a facility containing our research and development, laboratory and office space, which consists of approximately 51,000 square feet located at 780 Memorial Drive, Cambridge, Massachusetts. Our lease expires on March 31, 2025. This facility is our corporate headquarters. We believe that our facilities are sufficient to meet our current needs.

Item 3. Legal Proceedings

We are not currently a party to any material legal proceedings.

Item 4. Mine Safety Disclosures

Not applicable.

PART II

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

Market Information and Holders

Our common stock trades on the Nasdaq Global Select Market under the symbol "JNCE". As of March 1, 2019, we had approximately 22 holders of record of our common stock. This number does not include beneficial owners whose shares were held by nominees in street name.

Dividend Policy

We have never declared or paid cash dividends on our capital stock. We currently 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 pay dividends will be made at the discretion of our board of directors and will depend on various factors, including applicable laws, our results of operations, financial condition, future prospects, then applicable contractual restrictions and any other factors deemed relevant by our board of directors. Investors should not purchase our common stock with the expectation of receiving cash dividends.

Recent Sales of Unregistered Securities

None.

Purchase of Equity Securities

We did not purchase any of our registered equity securities during the period covered by this Annual Report on Form 10-K.

Item 6. Selected Financial Data

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

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

The following discussion and analysis of our financial condition and results of operations should be read together with our consolidated financial statements and related notes appearing elsewhere in this Annual Report on Form 10-K. In addition to historical information, this discussion and analysis contains forward-looking statements that involve risks, uncertainties and assumptions. Our actual results may differ materially from those anticipated in these forward-looking statements as a result of certain factors. We discuss factors that we believe could cause or contribute to these differences below and elsewhere in this Annual Report on Form 10-K, including those factors set forth in the section entitled "Cautionary Note Regarding Forward-Looking Statements and Industry Data" and in the section entitled "Risk Factors" in Part I, Item 1A.

Overview

We are a clinical-stage immunotherapy company dedicated to transforming the treatment of cancer by developing therapies that enable the immune system to attack tumors and provide long-lasting benefits to patients. We have developed a suite of integrated technologies that comprise our Translational Science Platform, enabling us to comprehensively interrogate the cellular and molecular composition of tumors. By focusing on specific cell types, both immune and non-immune, within tumors, we can prioritize targets and then identify related biomarkers designed to match the right therapy to the right patient. Through this scientific understanding of the tumor microenvironment, or TME, our goal is to effectively and efficiently identify and develop new cancer immunotherapies designed to benefit patients with tumors across the spectrum from highly inflamed, or "hot," to poorly inflamed, or "cold," and especially those not well served by current therapies.

Our most advanced product candidate, vopratelimab (formerly JTX-2011), is a clinical-stage monoclonal antibody that binds to and activates the **I**nducible T cell **CO-S**timulator, or ICOS, a protein on the surface of certain T cells commonly found in many solid tumors. Vopratelimab was assessed in a Phase 1/2 clinical trial that we refer to as ICONIC. In the initial Phase 1/2 portion of ICONIC, vopratelimab was found to be safe and well-tolerated, both alone and in combination with nivolumab, an anti-PD-1 antibody. At the June 2018 annual meeting of the American Society of Clinical Oncology, or ASCO, we reported Response Evaluation Criteria in Solid Tumors, or RECIST, responses and other tumor reductions as determined by investigator assessment that were associated with an ICOS pharmacodynamic biomarker. We subsequently reported that these responses were durable, lasting six or more months and that all responders, as determined by investigator assessments, remained on study for more than one year. ICONIC also includes an on-going dose-escalation Phase 1 portion to assess vopratelimab in combination with pembrolizumab, an anti-PD-1 antibody, and in combination with ipilimumab, an antibody that binds to CTLA-4 on certain T cells. This Phase 1 portion established the safety of vopratelimab in combination with each of ipilimumab and pembrolizumab. We plan to initiate additional Phase 2 clinical studies, including one or more new dosing schedules and combination sequences, in 2019 and expect to report preliminary efficacy data from these additional clinical studies in 2020. These anticipated Phase 2 clinical studies will evaluate vopratelimab in combination with ipilimumab, and, separately, using a predictive biomarker approach, will evaluate vopratelimab alone and/or in combination with a PD-1 inhibitor. These additional clinical studies are designed to determine whether vopratelimab can offer a treatment alternative to patients who otherwise do not display an effective response to currently approved therapies, and/or whether it can enhance the therapeutic benefit of currently approved therapies.

Our second product candidate, JTX-4014, is a clinical-stage anti-PD-1 antibody that we are developing primarily for potential use in combination with future product candidates, as we believe that combination therapy has the potential to be a mainstay of cancer immunotherapy. In December 2018, we commenced enrollment in a Phase 1 clinical trial of JTX-4014 monotherapy and completed enrollment in the first cohort in the fourth quarter of 2018. This Phase 1 clinical trial is designed to assess safety and to determine the recommended Phase 2 dose. We expect to identify the recommended Phase 2 dose in 2019.

JTX-8064, our third product candidate, is an antibody that binds to LILRB2, which is a cell surface receptor expressed on macrophages. JTX-8064 is the first tumor-associated macrophage candidate to emerge from our Translational Science Platform. We believe therapies targeting these innate immune cells may have the potential to benefit patients with tumors that are less likely to respond to existing T cell-focused approaches. We are currently conducting IND-enabling activities for JTX-8064, with the goal of filing an investigational new drug application, or IND, and initiating a Phase 1 clinical trial in 2019.

Beyond our product candidates, we are discovering and developing immunotherapies by leveraging our Translational Science Platform to systematically and comprehensively interrogate cell types within the TME. This enables us to develop therapies with the potential to benefit patients with tumors across the spectrum from hot to

cold tumor characteristics, including focusing on adaptive and innate immune cells. Therapies targeting these cell types and cell subsets may have the potential to complement existing approaches that focus on T effector cells and thereby benefit many patients who do not respond to the currently approved T effector cell-focused immunotherapies. In addition, we are discovering and developing multiple approaches, including targeting stromal cells, with the potential to convert cold tumors to hot tumors, thereby making the tumors more amenable to immunotherapy, perhaps in combination approaches.

In July 2016, we entered into a Master Research and Collaboration Agreement, or the Celgene Collaboration Agreement, and a Series B-1 Preferred Stock Purchase Agreement with Celgene Corporation, or Celgene. Under the terms of these agreements, we received a $225.0 million upfront cash payment and $36.1 million from the sale of 10,448,100 shares of our Series B-1 convertible preferred stock, which shares converted into 2,831,463 shares of common stock upon the completion of our initial public offering, or IPO, in 2017.

Under the Celgene Collaboration Agreement, we granted Celgene exclusive options to develop and commercialize our lead product candidate, vopratelimab, and up to four early-stage programs, or the Lead Program and Other Programs, consisting of targets to be selected from a pool of certain B cell, T regulatory cell and tumor-associated macrophage targets. Additionally, Celgene has an exclusive option to develop and commercialize our product candidate JTX-4014, which, upon exercise of such option, will be a shared program that may be used by both parties in and outside of the collaboration. Prior to Celgene exercising any of its options, we are responsible for all research and development activities under the Celgene Collaboration Agreement.

Upon the exercise of each program option, the parties will enter into a co-development and co-commercialization agreement, or the Co-Co Agreements, or, in the case of JTX-4014, a license agreement, or the JTX-4014 License Agreement, that governs the development and commercialization of the applicable program. Although the agreements will not be executed unless and until Celgene exercises an option, the parties have agreed to the terms of the Co-Co Agreements and the JTX-4014 License Agreement as part of the Celgene Collaboration Agreement. Under the Co-Co Agreements and the JTX-4014 License Agreement, we will share with Celgene the United States profits or losses and development costs on such collaboration program.

If Celgene exercises its option for a program other than JTX-4014, we will enter into a Co-Co Agreement pursuant to which Celgene will have the exclusive right to develop and commercialize the products arising out of such collaboration program outside of the United States, and we will be eligible to receive tiered royalties ranging from a high single digit to mid-teen percentage rate on net product sales outside of the United States. Under each Co-Co Agreement, we will also have the right to opt out of profit sharing and instead receive milestones and royalties.

Furthermore, if Celgene exercises its option for JTX-4014, we will enter into the JTX-4014 License Agreement, pursuant to which Celgene and we will each have equal rights to develop and commercialize JTX-4014 in combination with other proprietary molecules in their or our respective pipelines or in combination with products arising out of collaboration programs. Subject to terms specified in the license agreement for JTX-4014, the party owning the proprietary molecule that is combined with JTX-4014, if such molecule does not arise from a collaboration program with Celgene, will be solely responsible for all development and commercialization costs related to such combination. If JTX-4014 is combined with a product arising from a collaboration program, then the parties will share costs and, if co-packaged or co-formulated, profits or losses in accordance with the Co-Co Agreements for such other product.

Celgene may extend the initial four-year research term of the collaboration for up to three additional one-year periods upon payment of an extension fee for each additional year. Additionally, under the terms of the agreement, if Celgene exercises all of its options, all programs meet all milestones, including regulatory approvals in the United States and outside the United States, and Celgene extends the initial four-year research term for three additional years, we are eligible to earn up to approximately $2.6 billion in clinical, regulatory, and/or commercialization milestone payments, option-exercise fees and research term extension fees.

The Co-Co Agreements and the JTX-4014 License Agreement outline the terms of potential development, regulatory and commercial milestone payments. The development milestones are payable on initiation of certain clinical trials and range from $32.5 million to $105.0 million, per program, with an aggregate total of $290.0 million. The regulatory approval milestones are payable upon regulatory approval in the United States and outside the United States and range from $7.5 million to $50.0 million per milestone, with an aggregate total of $700.0 million. The commercial milestones are payable upon achievement of specified aggregate product sales outside the United States for each program and range from $40.0 million to $200.0 million per milestone, with an aggregate total of $1.270 billion. We are also eligible to receive royalties on product sales outside the United States ranging from high single digit to mid-teen royalties. If Celgene elects to exercise any of the program options, Celgene will pay us an

option-exercise fee of $10.0 million to $60.0 million that varies by program, with an aggregate of $182.5 million if Celgene exercises all six program options. The initial research term of the collaboration is four years, which can be extended, at Celgene's option, annually for up to three additional years for additional consideration that ranges from $30.0 million to $45.0 million per year, for an aggregate of $120.0 million if the term is extended for an additional three years. As of December 31, 2018, we had not received any option exercise, research term extension, milestone or royalty payments under the Celgene Collaboration Agreement.

Since inception, our operations have focused on organizing and staffing our company, business planning, raising capital, developing our Translational Science Platform and conducting research, preclinical studies and clinical trials. We do not have any products approved for sale. We are subject to a number of risks comparable to those of other similar companies, including dependence on key individuals; the need to develop commercially viable products; competition from other companies, many of which are larger and better capitalized; and the need to obtain adequate additional financing to fund the development of our products. We have funded our operations through December 31, 2018 primarily through proceeds received from our IPO, the upfront payment received under the Celgene Collaboration Agreement and private placements of our convertible preferred stock.

On February 1, 2017, we closed our IPO of 7,319,750 shares of our common stock at a public offering price of $16.00 per share, including 954,750 shares of our common stock issued upon the full exercise by the underwriters of their option to purchase additional shares. The gross proceeds from the IPO were $117.1 million, and net proceeds were $106.4 million, after deducting underwriting discounts and commissions and other offering expenses paid by us.

Due to our significant research and development expenditures, we have generated substantial operating losses in each annual period since our inception. We have incurred an accumulated deficit of $163.9 million through December 31, 2018. We expect to incur substantial additional losses in the future as we expand our research and development activities.

Financial Operations Overview

Revenue

For the year ended December 31, 2018, we recognized $65.2 million of collaboration revenue under the Celgene Collaboration Agreement related to the $225.0 million upfront payment received in 2016. We had $97.9 million of deferred revenue as of December 31, 2018, which is classified as either current or net of current portion in our consolidated balance sheets based on the period over which the revenue is expected to be recognized. As of December 31, 2018, we had not received any option exercise, research term extension, milestone or royalty payments under the Celgene Collaboration Agreement.

In the future, we expect to continue to generate revenue from the Celgene Collaboration Agreement and may generate revenue from product sales or other collaboration agreements, strategic alliances and licensing arrangements. We expect that our revenue will fluctuate from quarter-to-quarter and year-to-year based upon our pattern of performance under the Celgene Collaboration Agreement and as a result of the timing and amount of license fees, milestones, reimbursement of costs incurred and other payments and product sales, to the extent any are successfully commercialized. If we fail to complete the development of our product candidates in a timely manner or obtain regulatory approval for them, our ability to generate future revenue, and our results of operations and financial position, would be materially adversely affected.

Operating Expenses

Research and Development Expenses

Research and development expenses represent costs incurred by us for the discovery, development and manufacture of vopratelimab, JTX-4014, JTX-8064 and our potential future product candidates and include: external research and development expenses incurred under arrangements with third parties, including academic and non-profit institutions, contract research organizations, contract manufacturing organizations and consultants; salaries and personnel-related costs, including non-cash stock-based compensation expense; license fees to acquire in-process technology and other expenses, which include direct and allocated expenses for laboratory, facilities and other costs.

We use our employee and infrastructure resources across multiple research and development programs directed toward developing our Translational Science Platform and for identifying, testing and developing product

candidates. We manage certain activities such as contract research and manufacture of our product candidates and discovery programs through our third-party vendors.

At this time, we cannot reasonably estimate or know the nature, timing and estimated costs of the efforts that will be necessary to complete the development of our product candidates. We are also unable to predict when, if ever, material net cash inflows will commence from sales of our product candidates. This is due to the numerous risks and uncertainties associated with developing such product candidates, including the uncertainty of:

- addition and retention of key research and development personnel;
- establishing an appropriate safety profile with IND-enabling toxicology studies;
- the cost to acquire or make therapies to study in combination with our immunotherapies;
- successful enrollment in and completion of clinical trials;
- establishing agreements with third-party contract manufacturing organizations for clinical supply for our clinical trials and commercial manufacturing, if our product candidates are approved;
- receipt of marketing approvals from applicable regulatory authorities;
- commercializing products, if and when approved, whether alone or in collaboration with others;
- the cost to develop complementary diagnostics and/or companion diagnostics as needed for each of our development programs;
- the costs associated with the development of any additional product candidates we acquire through third-party collaborations or identify through our Translational Science Platform;
- the terms and timing of any collaboration, license or other arrangement, including the terms and timing of any milestone payments thereunder;
- obtaining and maintaining patent and trade secret protection and regulatory exclusivity for our products if and when approved; and
- continued acceptable safety profiles of the products following approval.

A change in the outcome of any of these variables with respect to the development of any of our product candidates would significantly change the costs, timing and viability associated with the development of that product candidate. We plan to increase our research and development expenses for the foreseeable future as we advance our product candidates through clinical trials and continue the enhancement of our Translational Science Platform, our collaboration with Celgene and the progression of our pipeline.

Due to the inherently unpredictable nature of preclinical and clinical development, we do not allocate all of our internal research and development expenses on a program-by-program basis as they primarily relate to personnel and lab consumables costs which are deployed across multiple programs under development. Our research and development expenses also include external costs, which we do track on a program-by-program basis following the program's nomination as a development candidate. We began incurring such external costs for vopratelimab in 2015, JTX-4014 in 2016 and JTX-8064 in 2017.

Included below are external research and development and external clinical and regulatory costs for vopratelimab, JTX-4014, JTX-8064 and our pre-development candidates:

	Year Ended December 31,	
(in thousands)	**2018**	**2017**
Vopratelimab	$ 19,647	$ 21,904
JTX-4014	7,585	6,460
JTX-8064	2,634	369
Pre-development candidates	1,022	1,250
Total external research and development and clinical and regulatory costs	$ 30,888	$ 29,983

Research and development activities account for a significant portion of our operating expenses. As we continue to implement our business strategy, we expect our research and development expenses to increase over the next several years. We expect that these expenses will increase as we:

- continue our Phase 1/2 clinical trial of vopratelimab;
- initiate further Phase 2 clinical trials of vopratelimab;
- continue our Phase 1 clinical trial of JTX-4014 and initiate future clinical trials;
- continue our IND-enabling activities for JTX-8064 and advance this product candidate into clinical trials;
- continue to identify and develop potential predictive biomarkers and complementary diagnostics and/or companion diagnostics for our product candidates;
- continue to develop and enhance our Translational Science Platform and advance our pipeline of immunotherapy programs and our early research activities into later stages of development; and
- increase our headcount to meet our evolving needs.

Product candidates in later stages of clinical development generally incur higher development costs than those in earlier stages of clinical development, primarily due to the increased size and duration of later-stage clinical trials.

General and Administrative Expenses

General and administrative expenses consist of salaries and personnel-related costs, including non-cash stock-based compensation expense, for our personnel in executive, business development, legal, finance and accounting, human resources and other administrative functions, consulting fees, facility costs not otherwise included in research and development expenses, fees paid for accounting and tax services and non-litigation legal costs. Non-litigation legal costs include general corporate legal fees, patent legal fees and related costs. We anticipate that our general and administrative expenses will increase in the future to support our continued operations.

Other Income, Net

Other income, net, consists primarily of interest and investment income on our cash, cash equivalents and investments.

Critical Accounting Policies and Estimates

Our management's discussion and analysis of our financial condition and results of operations is based on our consolidated financial statements, which have been prepared in accordance with generally accepted accounting principles in the United States. The preparation of these consolidated financial statements requires us to make estimates and assumptions that affect the amounts reported in the financial statements and accompanying notes. On an ongoing basis, we evaluate our estimates which include, but are not limited to, estimates related to revenue recognized under the Celgene Collaboration Agreement (including estimates of internal and external costs expected to be incurred to satisfy performance obligations), accrued expenses, stock-based compensation expense and income taxes. We base our estimates on historical experience and other market specific or other relevant assumptions we believe to be reasonable under the circumstances. Actual results could differ from those estimates.

While our significant accounting policies are described in more detail in the notes to our consolidated financial statements appearing elsewhere in this Annual Report on Form 10-K, we believe the following accounting policies to be most critical to the judgments and estimates used in the preparation of our consolidated financial statements.

Revenue Recognition

Effective January 1, 2018, we adopted Accounting Standards Codification, or ASC, 606, *Revenue from Contracts with Customers*. Under ASC 606, an entity recognizes revenue when its customer obtains control of promised goods or services, in an amount that reflects the consideration that the entity expects to receive in exchange for those goods or services. In applying ASC 606, we perform the following five steps: (i) identify the contract(s) with a customer; (ii) identify the promises and performance obligations in the contract; (iii) determine the transaction price; (iv) allocate the transaction price to the performance obligations in the contract; and (v) recognize revenue when (or as) we satisfy the performance obligations. We only apply the five-step model to contracts when it is probable that we will collect the consideration to which we are entitled in exchange for the goods or services we transfer to the customer. At contract inception, once the contract is determined to be within the scope of ASC 606, we assess the goods or services promised within each contract, determine those that are performance obligations and assess whether each promised good or service is distinct. We then recognize as revenue the amount of the transaction price that is allocated to the respective performance obligation when (or as) the performance obligation is

satisfied. See Note 3 to our consolidated financial statements included within Part IV, Item 15 of this Annual Report on Form 10-K for further information on the application of ASC 606 to the Celgene Collaboration Agreement.

Accrued Research and Development Expenses

As part of the process of preparing our consolidated financial statements, we are required to estimate our accrued expenses as of each balance sheet date. This process involves reviewing open contracts and purchase orders, communicating with our personnel to identify services that have been performed on our behalf and estimating the level of service performed and the associated cost incurred for the service when we have not yet been invoiced or otherwise notified of the actual cost. The majority of our service providers invoice us monthly in arrears for services performed or when contractual milestones are met.

We make estimates of our accrued expenses as of each balance sheet date based on facts and circumstances known to us at that time. We periodically confirm the accuracy of our estimates with the service providers and make adjustments if necessary. The significant estimates in our accrued research and development expenses include the costs incurred for services performed by our vendors in connection with research and development activities for which we have not yet been invoiced. We record our expenses related to research and development activities on our estimates of the services received and efforts expended pursuant to quotes and contracts with vendors that conduct research and development on our behalf. The financial terms of these agreements are subject to negotiation, vary from contract to contract and may result in uneven payment flows. There may be instances in which payments made to our vendors will exceed the level of services provided and result in a prepayment of the research and development expenses. In accruing service fees, we estimate the time period over which services will be performed and the level of effort to be expended in each period. If the actual timing of the performance of services or the level of effort varies from our estimate, we adjust the accrual or prepaid expense accordingly. Non-refundable advance payments for goods and services that will be used in future research and development activities are expensed when the activity has been performed or when the goods have been received rather than when the payment is made.

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

Stock-based Compensation

We account for share-based payments in accordance with ASC 718, *Compensation—Stock Compensation.* ASC 718 requires all share-based payments to employees, including grants of employee stock options, restricted stock awards and restricted stock units, to be recognized as expense in the consolidated statements of operations based on their grant date fair values. For stock options granted to employees and to members of our board of directors for their services on the board of directors, we estimate the grant date fair value of each stock option using the Black-Scholes option-pricing model. For restricted stock awards and restricted stock units granted to employees, we estimate the grant date fair value of each award using intrinsic value, which is based on the value of the underlying common stock less any purchase price. For share-based payments subject to service-based vesting conditions, we recognize stock-based compensation expense equal to the grant date fair value of share-based payment on a straight-line basis over the requisite service period.

The Black-Scholes option pricing model requires the input of certain subjective assumptions, including (i) the calculation of expected term of the share-based payment, (ii) the risk-free interest rate, (iii) the expected stock price volatility and (iv) the expected dividend yield. We use the simplified method as prescribed by SEC Staff Accounting Bulletin No. 107 to calculate the expected term for stock options granted to employees as we do not have sufficient historical exercise data to provide a reasonable basis upon which to estimate the expected term. We determine the risk-free interest rate based on a treasury instrument whose term is consistent with the expected term of the stock options. Because there had been no public market for our common stock prior to the IPO, there is a lack of historical and implied volatility data. Accordingly, we base our estimates of expected volatility on the historical volatility of a group of publicly-traded companies with similar characteristics to us, including stage of product development and therapeutic focus within the life sciences industry. Historical volatility is calculated over a period of time commensurate with the expected term of the share-based payment. We use an assumed dividend yield of zero as we have never paid dividends on our common stock, nor do we expect to pay dividends on our common stock in the foreseeable future.

We account for forfeitures of all share-based payments when such forfeitures occur.

Income Taxes

Income taxes are recorded in accordance with ASC 740, *Income Taxes*, which provides for deferred taxes using an asset and liability approach. We recognize deferred tax assets and liabilities for the expected future tax consequences of events that have been included in the consolidated financial statements or tax returns. Deferred tax assets and liabilities are determined based on the difference between the financial statement and tax bases of assets and liabilities using enacted tax rates in effect for the year in which the differences are expected to reverse. A valuation allowance against deferred tax assets is recorded if, based on the weight of the available evidence, it is more likely than not that some or all of the deferred tax assets will not be realized.

We account for uncertain tax positions using a more-likely-than-not threshold for recognizing and resolving uncertain tax positions. The evaluation of uncertain tax positions is based on factors, including, but not limited to, changes in the law, the measurement of tax positions taken or expected to be taken in tax returns, the effective settlement of matters subject to audit, new audit activity and changes in facts or circumstances related to a tax position.

Recent Accounting Pronouncements

See Note 2 to our consolidated financial statements included within Part IV, Item 15 of this Annual Report on Form 10-K for a description of recent accounting pronouncements applicable to our business.

Results of Operations

Comparison of the Years Ended December 31, 2018 and 2017

The following table summarizes our results of operations for the years ended December 31, 2018 and 2017:

	Year Ended December 31,		
(in thousands)	**2018**	**2017**	**$ Change**
Revenue:			
Collaboration revenue—related party	$ 65,201	$ 71,644	$ (6,443)
Operating expenses:			
Research and development	70,052	67,798	2,254
General and administrative	26,443	23,061	3,382
Total operating expenses	96,495	90,859	5,636
Operating loss	(31,294)	(19,215)	(12,079)
Other income, net	3,961	2,808	1,153
Loss before provision for income taxes	(27,333)	(16,407)	(10,926)
Provision for income taxes	46	36	10
Net loss	$ (27,379)	$ (16,443)	$ (10,936)

Collaboration Revenue

Collaboration revenue for the years ended December 31, 2018 and 2017 was solely related to the recognition of the upfront payment we received under our Celgene Collaboration Agreement that was executed in July 2016. Effective January 1, 2018, we adopted ASC 606. Under ASC 606, we have transitioned from recognizing revenue on a straight-line basis over the estimated performance period for each unit of accounting, which was a permitted method of revenue recognition under previous accounting guidance, to recognizing revenue based on our pattern of performance for each performance obligation. As we adopted ASC 606 using the modified retrospective method, collaboration revenue for the year ended December 31, 2017 continues to be presented under previous accounting guidance.

Research and Development Expenses

The following table summarizes our research and development expenses for years ended December 31, 2018 and 2017:

	Year Ended December 31,		
(in thousands)	**2018**	**2017**	**$ Change**
Employee compensation	$ 21,977	$ 18,839	$ 3,138
External research and development	14,211	16,297	(2,086)
External clinical and regulatory	16,677	13,686	2,991
Lab consumables	7,411	9,364	(1,953)
Consulting research	1,601	1,096	505
Facility costs	5,726	6,127	(401)
Other research	2,449	2,389	60
Total research and development expenses	$ 70,052	$ 67,798	$ 2,254

Research and development expenses increased by $2.3 million from $67.8 million for the year ended December 31, 2017 to $70.1 million for the year ended December 31, 2018. The increase in research and development expenses was primarily attributable to the following:

- $3.1 million of increased employee compensation costs, including $1.7 million of increased stock-based compensation expense; and
- $3.0 million of increased external clinical and regulatory costs related to our ongoing vopratelimab Phase 1/2 clinical trial, as well as the initiation of our JTX-4014 Phase 1 clinical trial.

These increases were offset by the following decreases:

- $2.1 million of decreased external research and development costs primarily attributable to the manufacture of clinical trial materials and related activities for vopratelimab during the year ended December 31, 2017; and
- $2.0 million of decreased lab consumables costs.

General and Administrative Expenses

The following table summarizes our general and administrative expenses for the years ended December 31, 2018 and 2017:

	Year Ended December 31,		
(in thousands)	**2018**	**2017**	**$ Change**
Employee compensation	$ 13,049	$ 9,055	$ 3,994
Professional services	4,880	5,016	(136)
Facility costs	4,516	5,216	(700)
Other	3,998	3,774	224
Total general and administrative expenses	$ 26,443	$ 23,061	$ 3,382

General and administrative expenses increased by $3.4 million from $23.1 million for the year ended December 31, 2017 to $26.4 million for the year ended December 31, 2018. The increase in general and administrative expenses was primarily attributable to $4.0 million of increased employee compensation costs, including $2.9 million of increased stock-based compensation expense. This increase was partially offset by $0.7 million of decreased facility costs associated with our exit of our previous corporate headquarters in May 2017.

Other Income, net

Other income, net, increased by $1.2 million from $2.8 million for the year ended December 31, 2017 to $4.0 million for the year ended December 31, 2018. The change in other income, net, is attributable to increased interest and investment income on our cash, cash equivalents and investments as a result of an overall increased rate of return.

Liquidity and Capital Resources

Sources of Liquidity

We have funded our operations through December 31, 2018 primarily through net proceeds from our IPO of $106.4 million, a non-refundable upfront payment of $225.0 million received in connection with the Celgene Collaboration Agreement and gross proceeds from private placements of our convertible preferred stock of $139.1 million. As of December 31, 2018, we had cash, cash equivalents and investments of $195.9 million.

Funding Requirements

Our plan of operation is to continue implementing our business strategy, the research and development of our product candidates vopratelimab, JTX-4014 and JTX-8064, our preclinical development activities, the expansion of our research pipeline and the enhancement of our internal research and development capabilities. Due to the inherently unpredictable nature of preclinical and clinical development and given the early stage of our programs and product candidates, we cannot reasonably estimate the costs we will incur and the timelines that will be required to complete development, obtain marketing approval, and commercialize our products, if and when approved. For the same reasons, we are also unable to predict when, if ever, we will generate revenue from product sales or whether, or when, if ever, we may achieve profitability. Clinical and preclinical development timelines, the probability of success, and development costs can differ materially from expectations. In addition, we cannot forecast which products, if and when approved, may be subject to future collaborations, when such arrangements will be secured, if at all, and to what degree such arrangements would affect our development plans and capital requirements.

Due to our significant research and development expenditures, we have generated substantial operating losses since inception. We have incurred an accumulated deficit of $163.9 million through December 31, 2018. We expect to incur substantial additional losses in the future as we expand our research and development activities and continue to advance our programs. Based on our research and development plans, we expect that our existing cash, cash equivalents and investments of $195.9 million will enable us to fund our operating expenses and capital expenditure requirements for at least the next 24 months. However, we have based this estimate on assumptions that may prove to be incorrect, and we could exhaust our capital resources sooner than we expect. The timing and amount of our operating expenditures will depend largely on:

- the timing and progress of preclinical and clinical development activities;
- the cost to access, acquire, or develop therapies to study in combination with our immunotherapies;
- successful enrollment in and completion of clinical trials;
- the cost to develop complementary diagnostics and/or companion diagnostics as needed for each of our development programs;
- our ability to establish agreements with third-party manufacturers for clinical supply for our clinical trials and, if our product candidate is approved, commercial manufacturing;
- the costs associated with the development of any additional product candidates we acquire through acquisition, third-party collaborations or identify through our Translational Science Platform;
- our ability to maintain our current research and development programs and enhancement of our Translational Science Platform;
- addition and retention of key research and development personnel;
- our efforts to enhance operational, financial and information management systems, and hire additional personnel, including personnel to support development of our product candidates;
- the legal patent costs involved in prosecuting patent applications and enforcing patent claims and other intellectual property claims;
- the costs and ongoing investments to in-license or acquire additional technologies, including the in-license of intellectual property related to our potential product candidates, the effectiveness of which is subject to certain conditions; and
- the terms and timing of any collaboration, license or other arrangement, including the terms and timing of any option and milestone payments thereunder.

A change in the outcome of any of these or other variables with respect to the development of any of our product candidates could significantly change the costs and timing associated with the development of that product candidate. Furthermore, our operating plans may change in the future, and we may need additional funds to meet operational needs and capital requirements associated with such operating plans.

In addition to the variables described above, if and when any of our product candidates successfully complete development, we expect to incur substantial additional costs associated with regulatory filings, marketing approval, post-marketing requirements, maintaining our intellectual property rights, and regulatory protection, in addition to other costs. We cannot reasonably estimate these costs at this time.

Until such time, if ever, as we can generate substantial product revenue, we expect to finance our cash needs through a combination of equity or debt financings and collaboration arrangements, including our Celgene Collaboration Agreement. We currently do not have a credit facility or committed sources of capital. To the extent that we raise additional capital through the future sale of equity or debt, the ownership interests of our stockholders will be diluted, and the terms of these securities may include liquidation or other preferences that adversely affect the rights of our existing common stockholders. If we raise additional funds through the issuance of debt securities, these securities could contain covenants that would restrict our operations. We may require additional capital beyond our currently anticipated amounts. Additional capital may not be available on reasonable terms, or at all. If we raise additional funds through collaboration arrangements in the future, we may have to relinquish valuable rights to our technologies, future revenue streams 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 development or future commercialization efforts, or grant rights to develop and market product candidates that we would otherwise prefer to develop and market ourselves.

Cash Flows

The following table provides information regarding our cash flows for the years ended December 31, 2018 and 2017:

	Year Ended December 31,	
(in thousands)	**2018**	**2017**
Net cash (used in) provided by:		
Operating activities	$ (63,613)	$ (90,988)
Investing activities	86,414	(38,021)
Financing activities	1,546	107,470
Net increase (decrease) in cash, cash equivalents and restricted cash	$ 24,347	$ (21,539)

Cash Used in Operating Activities

Net cash used in operating activities for the year ended December 31, 2018 was $63.6 million, compared to net cash used in operating activities of $91.0 million for the year ended December 31, 2017. Cash used in operating activities decreased by $27.4 million primarily due to $16.8 million of state and federal income tax refunds received during the year ended December 31, 2018 as compared to $16.8 million of state and federal tax income payments made during the year ended December 31, 2017, partially offset by increased operating expenses.

Cash Provided by (Used in) Investing Activities

Net cash provided by investing activities for the year ended December 31, 2018 was $86.4 million, compared to net cash used in investing activities of $38.0 million for the year ended December 31, 2017. This net change of $124.4 million was primarily due to purchases of investments during the year ended December 31, 2017, using the net proceeds received from our IPO in 2017. During the year ended December 31, 2018, proceeds from maturities and sales of investments of $340.7 million were either re-invested or used to fund operations. In addition, purchases of property and equipment decreased by $13.7 million primarily due to purchases of leasehold improvements and laboratory equipment associated with our corporate headquarters during the year ended December 31, 2017.

Cash Provided by Financing Activities

Net cash provided by financing activities for the year ended December 31, 2018 was $1.5 million, compared to net cash provided by financing activities of $107.5 million for the year ended December 31, 2017. Cash provided by financing activities decreased by $105.9 million primarily due to the receipt of $106.4 million of net proceeds from our IPO, after deducting underwriting discounts and commissions and other offering expenses paid by us. A portion of these offering expenses were paid during the year ended December 31, 2016. No such financings occurred during the year ended December 31, 2018. This decrease was partially offset by an increase of $1.1 million in proceeds received from the exercise of stock options during the year ended December 31, 2018 as compared to the year ended December 31, 2017.

Off-Balance Sheet Arrangements

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

Item 7A. Quantitative and Qualitative Disclosures about Market Risk

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

Item 8. Financial Statements and Supplementary Data

The financial statements required to be filed pursuant to this Item 8 are appended to this Annual Report on Form 10-K. An index of those financial statements is found in Part IV, Item 15.

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

None.

Item 9A. Controls and Procedures

Evaluation of Disclosure Controls and Procedures

Our management, with the participation of our principal executive officer and our principal financial officer, evaluated the effectiveness of our disclosure controls and procedures as of December 31, 2018. The term “disclosure controls and procedures,” as defined in Rules 13a-15(e) and 15d-15(e) under the Securities Exchange Act of 1934, or the Exchange Act, means controls and other procedures of a company that are designed to ensure that information required to be disclosed by the company in the reports that it files or submits under the Exchange Act is recorded, processed, summarized and reported, within the time periods specified in the Securities and Exchange Commission’s rules and forms. Disclosure controls and procedures include, without limitation, controls and procedures designed to ensure that information required to be disclosed by a company in the reports that it files or submits under the Exchange Act is accumulated and communicated to the company’s management, including its principal executive and principal financial officers, or persons performing similar functions, as appropriate to allow timely decisions regarding required disclosure. Our management recognizes that any controls and procedures, no matter how well designed and operated, can provide only reasonable assurance of achieving their objectives and our management necessarily applies its judgment in evaluating the cost-benefit relationship of possible controls and procedures. Based on the evaluation of our disclosure controls and procedures as of December 31, 2018, our principal executive officer and principal financial officer concluded that, as of such date, our disclosure controls and procedures were effective at the reasonable assurance level.

Management’s Report on Internal Control Over Financial Reporting

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

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

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

Under the supervision of and with the participation of our principal executive officer and principal financial officer, our management assessed the effectiveness of our internal control over financial reporting as of December 31, 2018 based on the criteria set forth by the Committee of Sponsoring Organizations of the Treadway Commission in Internal Control—Integrated Framework (2013). Based on this assessment, management concluded that our internal control over financial reporting was effective as of December 31, 2018.

This Annual Report on Form 10-K does not include an attestation report of our independent registered public accounting firm due to a transition period established by rules of the SEC for newly public companies.

Changes in Internal Control over Financial Reporting

There was no change in our internal control over financial reporting (as defined in Rules 13a-15(f) and 15(d)-15(f) under the Exchange Act) that occurred during the fourth quarter of the year ended December 31, 2018 that has materially affected, or is reasonably likely to materially affect, our internal control over financial reporting.

Item 9B. Other Information

None.

PART III

Item 10. Directors, Executive Officers and Corporate Governance

Board of Directors

Board Composition and Structure

The Board of Directors is currently comprised of eight members. Below is a list of the names, ages as of March 1, 2019, and classification of the individuals who currently serve as our directors.

Name	Age	Position
Luis A. Diaz, Jr., M.D.	48	Director (Class II)
Barbara Duncan	54	Director (Class II)
J. Duncan Higgons	64	Director (Class I)
Robert Kamen, Ph.D.	74	Director (Class II)
Perry Karsen	63	Chairman of the Board of Directors (Class III)
Richard Murray, Ph.D.	60	Director (Class III); Chief Executive Officer and President
Cary Pfeffer, M.D.	56	Director (Class III)
Robert Tepper, M.D.	63	Director (Class I)

Director Biographies

Luis Diaz, Jr., M.D.—Dr. Diaz has served as the head of the solid tumor oncology division and a faculty member at the Memorial Sloan Kettering Cancer Center since December 2016. From 2004 to December 2016, Dr. Diaz was a faculty member and physician at Johns Hopkins University School of Medicine. Dr. Diaz is also a founder and board member, and from 2010 to April 2016 served as president, chief executive officer and chief medical officer, of Personal Genome Diagnostics Inc., a private cancer genome analysis company. He received his M.D. from the University of Michigan, where he also received his B.S. in Microbiology. We believe Dr. Diaz is qualified to serve on our board of directors due to his background as a physician focused on oncology and his experience as a faculty member at a major hospital and medical center.

Barbara Duncan—Ms. Duncan served as the chief financial officer of Intercept Pharmaceuticals Inc., a public biopharmaceutical company, from 2009 to June 2016 and as treasurer from 2010 to September 2016. She has served on the board of directors of Adaptimmune Therapeutics plc since June 2016, Aevi Genomic Medicine, Inc. (formerly Medgenics, Inc.) since June 2015, ObsEva SA since December 2016, Ovid Therapeutics, Inc. since June 2017 and Innoviva, Inc. from September 2016 to April 2018, all of which are public companies. Ms. Duncan holds an M.B.A. from the Wharton School of Business and a B.S. from Louisiana State University. We believe Ms. Duncan is qualified to serve on our board of directors because of her experience in the biopharmaceutical industry, her experience in the financial sector and membership on boards of directors of other public and private companies.

J. Duncan Higgons—Mr. Higgons served as chief operating officer of Agios Therapeutics, Inc., a public biopharmaceutical company, from 2009 to January 2016. Mr. Higgons serves on the board of directors of Rheos Medicines, Inc., a private biopharmaceutical company, Auron Therapeutics, Inc., a private cancer therapeutics company, and PsiOxus Therapeutics Ltd., a private cancer therapeutics company. He holds a B.Sc. in Mathematics from King's College University of London and a M.Sc. in Economics from London Business School. We believe that Mr. Higgons is qualified to serve on our board of directors due to his leadership and management experience.

Robert Kamen, Ph.D.—Dr. Kamen has been a venture partner at Third Rock Ventures, LLC, or TRV, since December 2017, and he previously served as an entrepreneur-in-residence at TRV from 2010 through 2017. Dr. Kamen also served as our interim chief technology officer from February 2013 to December 2015. Dr. Kamen has served on the board of directors of Neon Therapeutics, Inc., a public immuno-oncology company, since 2015 and serves on the boards of directors for several private companies, including EpimAb Biotherapeutics, Inc. and Lycera Corporation. Dr. Kamen holds a Ph.D. in biochemistry and molecular biology from Harvard University and a B.S. in biophysics from Amherst College. We believe that Dr. Kamen is qualified to serve on our board of directors because of his experience in the venture capital and life sciences industries, membership on various other boards of directors, and his leadership and management experience.

Perry Karsen—Mr. Karsen has served as the chairman of our board of directors since April 2016. Previously, Mr. Karsen was the chief executive officer of the Celgene Cellular Therapeutics division of Celgene Corporation, or Celgene, a global biopharmaceutical company, from May 2013 until his retirement in December 2015. Mr. Karsen served as executive vice president and chief operations officer of Celgene from 2010 to May 2013, and as senior vice president and head of worldwide business development of Celgene from 2004 to 2009. Mr. Karsen was also a venture partner at TRV from January 2016 through January 2018. He has served as the chairman of the board of directors of Intellia Therapeutics, Inc. since April 2016, as a member of the board of directors and executive chairman of OncoMed Pharmaceuticals, Inc. since January 2016 and January 2018, respectively, and a member of the board of directors of Voyager Therapeutics, Inc. since July 2015, all of which are public life sciences companies. Previously, Mr. Karsen served on the boards of directors of Alliqua Biomedical, Inc. from November 2012 through February 2016, Agios Pharmaceuticals, Inc. from November 2011 through March 2016, and Navidea Biopharmaceuticals, Inc. from February 2014 through July 2015. Mr. Karsen received a Masters of Management from Northwestern University's Kellogg Graduate School of Management, a Masters of Arts in Teaching of Biology from Duke University and a B.S. in Biological Sciences from the University of Illinois, Urbana-Champaign. We believe Mr. Karsen is qualified to serve on our board of directors because of his executive leadership experience and membership on boards of directors of other public companies.

Richard Murray, Ph.D.—Dr. Murray has served as our president, chief executive officer and a member of our board of directors since July 2014. Prior to joining Jounce, Dr. Murray served as senior vice president of biologics and vaccines research and development at Merck & Co., a global healthcare company, from 2009 to June 2014, where he was responsible for the advancement of biologics and vaccines, including Merck's cancer immunotherapy pipeline. Dr. Murray holds a Ph.D. in microbiology and immunology from the University of North Carolina at Chapel Hill and a B.S. in microbiology from the University of Massachusetts, Amherst. We believe that Dr. Murray is qualified to serve on our board of directors due to his operating and historical experience gained from serving as our president, chief executive officer and as a board member, combined with his experience in drug research and development.

Cary Pfeffer, M.D.—Dr. Pfeffer is a partner at TRV, which he joined in 2007. Dr. Pfeffer served as the chairman of our board from July 2014 to April 2016 and as our interim chief executive officer from February 2013 to July 2014. Dr. Pfeffer was the interim chief executive officer of Neon Therapeutics, Inc. from October 2015 to September 2016, the interim chief business officer of Rheos Medicines, Inc. from March 2018 to November 2018, and the interim chief business officer of Casma Therapeutics, Inc. from May 2018 to December 2018. Dr. Pfeffer has served as a director of Neon Therapeutics, Inc. since May 2015 and is currently the chairman of the board; he also serves on the boards of directors for several private companies, including Casma Therapeutics, Inc., Edimer Pharmaceuticals, Inc., Rheos Medicines, Inc. and Tango Therapeutics, Inc. From August 2009 to September 2016, Dr. Pfeffer was a member of the board of directors of Eleven Biotherapeutics, Inc., a public biologics oncology company, and served as its chief business officer from February 2010 to September 2011. Dr. Pfeffer received an M.B.A. from the Wharton School of Business, an M.D. from the University of Pennsylvania School of Medicine and a B.A. in biochemistry from Columbia University. We believe that Dr. Pfeffer is qualified to serve on our board of directors because of his experience in the venture capital industry, life sciences industry, membership on various other boards of directors, his prior service as our president and chief executive officer, and his leadership and management experience.

Robert Tepper, M.D.— Dr. Tepper is a partner at TRV, which he co-founded in 2007. From February 2013 to January 2015, Dr. Tepper served as our interim chief scientific officer. He also served as interim chief science officer of Casma Therapeutics, Inc. from May 2018 to December 2018, and of Neon Therapeutics, Inc. from October 2015 to November 2016. Dr. Tepper serves on the boards of directors of Allena Pharmaceuticals, Inc., Constellation Pharmaceuticals, Inc., and Neon Therapeutics, Inc., all public biopharmaceutical companies, as well as Casma Therapeutics, Inc., a private biotechnology company. Previously, Dr. Tepper served on the board of directors of bluebird bio, Inc. from September 2010 through March 2015, Kala Pharmaceuticals, Inc. from December 2009 through June 2018 and various other private life science companies. Dr. Tepper received an M.D. from Harvard Medical School and an A.B. in biochemistry from Princeton University. We believe that Dr. Tepper is qualified to serve on our board of directors due to his experience in the venture capital industry, particularly with biotech and pharmaceutical companies, combined with his experience building and leading research and development operations, serving on the boards of public and private life sciences companies and as faculty and advisory board members of several healthcare institutions.

Code of Ethics

We have adopted a written code of business conduct and ethics that applies to our directors, officers, and employees, including our principal executive officer, principal financial officer, principal accounting officer or controller, or persons performing similar functions. A copy of the code is posted on the Corporate Governance section of our website, which is located at www.jouncetx.com. If we make any substantive amendments to, or grant any waivers from, the code of

business conduct and ethics for any officer or director, we will disclose the nature of such amendment or waiver on our website or in a current report on Form 8-K. We will provide any person, without charge, a copy of such Code of Business Conduct and Ethics upon written request, which may be mailed to 780 Memorial Drive, Cambridge, MA 02139, Attn: Corporate Secretary.

Additional information required by this Item 10 will be included in the sections captioned “Proposal 1 - Election of Three Class II Directors,” “Corporate Governance” and “Section 16(a) Beneficial Ownership Reporting Compliance” in our definitive Proxy Statement for our 2019 Annual Meeting of Stockholders to be filed with the SEC within 120 days of December 31, 2018, which information is incorporated herein by reference.

Item 11. Executive Compensation

The information required by this Item 11 will be included in the section captioned “Executive and Director Compensation” in our definitive Proxy Statement for our 2019 Annual Meeting of Stockholders to be filed with the SEC within 120 days of December 31, 2018, which information is incorporated herein by reference.

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

The information required by this Item 12 will be included in the section captioned “Principal Stockholders” and “Equity Compensation Plan Information” in our definitive Proxy Statement for our 2019 Annual Meeting of Stockholders to be filed with the SEC within 120 days of December 31, 2018, which information is incorporated herein by reference.

Item 13. Certain Relationships and Related Transactions and Director Independence

The information required by this Item 13 will be included in the sections captioned “Corporate Governance” and “Transactions with Related Persons” in our definitive Proxy Statement for our 2019 Annual Meeting of Stockholders to be filed with the SEC within 120 days of December 31, 2018, which information is incorporated herein by reference.

Item 14. Principal Accounting Fees and Services

The information required by this Item 14 will be included in the section captioned “Ratification of Selection of Independent Registered Public Accounting Firm” in our definitive Proxy Statement for our 2019 Annual Meeting of Stockholders to be filed with the SEC within 120 days of December 31, 2018, which information is incorporated herein by reference.

PART IV

Item 15. Exhibits and Financial Statement Schedules

(1) Financial Statements

The following documents are attached hereto and are filed as part of this Annual Report on Form 10-K.

(2) Financial Statement Schedules

Schedules have been omitted since they are either not required or not applicable or the information is otherwise included herein.

(3) Exhibits

The exhibits filed or furnished as part of this Annual Report on Form 10-K are listed in the Exhibit Index immediately preceding the signatures, which Exhibit Index is incorporated herein by reference.

Item 16. Form 10-K Summary

None.

Report of Independent Registered Public Accounting Firm

To the Stockholders and the Board of Directors of Jounce Therapeutics, Inc.

Opinion on the Financial Statements

We have audited the accompanying consolidated balance sheets of Jounce Therapeutics, Inc. (the "Company") as of December 31, 2018 and 2017, the related consolidated statements of operations, comprehensive loss, convertible preferred stock, contingently redeemable common stock and stockholders' (deficit) equity, and cash flows for each of the two 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 financial position of the Company at December 31, 2018 and 2017, and the results of its operations and its cash flows for each of the two years in the period ended December 31, 2018, in conformity with U.S. generally accepted accounting principles.

Adoption of ASC 606

As discussed in Note 2 to the consolidated financial statements, the Company changed its method of accounting for revenue in 2018 due to the adoption of Accounting Standards Update (ASU) No. 2014-09, *Revenue from Contracts with Customers (Topic 606)*, and the related amendments.

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 2013.

Boston, Massachusetts
March 6, 2019

Jounce Therapeutics, Inc.
Consolidated Balance Sheets
(amounts in thousands, except par value amounts)

	December 31,	
	2018	2017
Assets:		
Current assets:		
Cash and cash equivalents	$ 47,906	$ 23,559
Short-term investments	141,968	212,093
Prepaid expenses and other current assets	2,335	19,945
Total current assets	192,209	255,597
Property and equipment, net	13,540	16,151
Long-term investments	5,990	22,199
Other non-current assets	2,713	2,713
Total assets	$ 214,452	$ 296,660
Liabilities and stockholders' equity:		
Current liabilities:		
Accounts payable	$ 3,272	$ 2,849
Accrued expenses	6,952	8,454
Deferred rent and lease incentive, current	61	61
Deferred revenue, current—related party	55,157	51,142
Other current liabilities	104	45
Total current liabilities	65,546	62,551
Deferred rent and lease incentive, net of current portion	2,062	1,955
Deferred revenue, net of current portion—related party	42,715	65,018
Other non-current liabilities	—	27
Total liabilities	110,323	129,551
Commitments and contingencies (Note 15)		
Stockholders' equity:		
Preferred stock, $0.001 par value: 5,000 shares authorized at December 31, 2018 and 2017; no shares issued or outstanding at December 31, 2018 or 2017	—	—
Common stock, $0.001 par value: 160,000 shares authorized at December 31, 2018 and 2017; 32,948 and 32,265 shares issued at December 31, 2018 and 2017, respectively; 32,941 and 32,249 shares outstanding at December 31, 2018 and 2017, respectively	33	32
Additional paid-in capital	268,081	257,101
Accumulated other comprehensive loss	(78)	(409)
Accumulated deficit	(163,907)	(89,615)
Total stockholders' equity	104,129	167,109
Total liabilities and stockholders' equity	$ 214,452	$ 296,660

The accompanying notes are an integral part of these consolidated financial statements.

Jounce Therapeutics, Inc.
Consolidated Statements of Operations
(amounts in thousands, except per share amounts)

	Year Ended December 31,	
	2018	**2017**
Revenue:		
Collaboration revenue—related party	$ 65,201	$ 71,644
Operating expenses:		
Research and development	70,052	67,798
General and administrative	26,443	23,061
Total operating expenses	96,495	90,859
Operating loss	(31,294)	(19,215)
Other income, net	3,961	2,808
Loss before provision for income taxes	(27,333)	(16,407)
Provision for income taxes	46	36
Net loss	$ (27,379)	$ (16,443)
Reconciliation of net loss to net loss attributable to common stockholders:		
Net loss	$ (27,379)	$ (16,443)
Accrued dividends on Series A convertible preferred stock	—	(268)
Accrued dividends on Series B convertible preferred stock	—	(318)
Accrued dividends on Series B-1 convertible preferred stock	—	(208)
Net loss attributable to common stockholders	$ (27,379)	$ (17,237)
Net loss per share attributable to common stockholders, basic and diluted	$ (0.84)	$ (0.57)
Weighted-average common shares outstanding, basic and diluted	32,567	30,055

The accompanying notes are an integral part of these consolidated financial statements.

Jounce Therapeutics, Inc.
Consolidated Statements of Comprehensive Loss
(amounts in thousands)

	Year Ended December 31,	
	2018	**2017**
Net loss	$ (27,379)	$ (16,443)
Other comprehensive income:		
Unrealized gain on available-for-sale securities	331	24
Comprehensive loss	$ (27,048)	$ (16,419)

The accompanying notes are an integral part of these consolidated financial statements.

Jounce Therapeutics, Inc.
Consolidated Statements of Convertible Preferred Stock, Contingently Redeemable Common Stock and Stockholders' (Deficit) Equity
(amounts in thousands)

	Series A Convertible Preferred Stock		Series B Convertible Preferred Stock		Series B-1 Convertible Preferred Stock		Contingently Redeemable Common Stock	Common Stock		Additional Paid-In Capital	Accumulated Other Comprehensive Loss	Accumulated Deficit	Total Stockholders' (Deficit) Equity
	Shares	Amount	Shares	Amount	Shares	Amount	Amount	Shares	Amount				
Balance at December 31, 2016	47,000	47,112	24,779	55,849	10,448	36,077	1,921	2,424	2	4,515	(433)	(73,172)	(69,088)
Issuance of common stock from initial public offering, net of issuance costs of $2,529	—	—	—	—	—	—	—	7,320	7	106,381	—	—	106,388
Conversion of convertible preferred stock into common stock upon closing of initial public offering	(47,000)	(47,112)	(24,779)	(55,849)	(10,448)	(36,077)	—	22,284	23	139,015	—	—	139,038
Reclassification of restricted stock awards upon termination of put option	—	—	—	—	—	—	(2,191)	—	—	2,191	—	—	2,191
Exercise of common stock options	—	—	—	—	—	—	—	144	—	462	—	—	462
Vesting of restricted stock awards	—	—	—	—	—	—	—	77	—	32	—	—	32
Stock-based compensation expense	—	—	—	—	—	—	270	—	—	4,505	—	—	4,505
Other comprehensive income	—	—	—	—	—	—	—	—	—	—	24	—	24
Net loss	—	—	—	—	—	—	—	—	—	—	—	(16,443)	(16,443)
Balance at December 31, 2017	—	—	—	—	—	—	—	32,249	32	257,101	(409)	(89,615)	167,109
Exercise of common stock options	—	—	—	—	—	—	—	683	1	1,545	—	—	1,546
Vesting of restricted stock awards	—	—	—	—	—	—	—	9	—	28	—	—	28
Stock-based compensation expense	—	—	—	—	—	—	—	—	—	9,407	—	—	9,407
Other comprehensive income	—	—	—	—	—	—	—	—	—	—	331	—	331
Cumulative effect adjustment upon adoption of ASC 606	—	—	—	—	—	—	—	—	—	—	—	(46,913)	(46,913)
Net loss	—	—	—	—	—	—	—	—	—	—	—	(27,379)	(27,379)
Balance at December 31, 2018	—	$ —	—	$ —	—	$ —	$ —	32,941	$ 33	$ 268,081	$ (78)	$ (163,907)	$ 104,129

The accompanying notes are an integral part of these consolidated financial statements.

Jounce Therapeutics, Inc.
Consolidated Statements of Cash Flows
(amounts in thousands)

	Year Ended December 31,	
	2018	**2017**
Operating activities:		
Net loss	$ (27,379)	$ (16,443)
Adjustments to reconcile net loss to net cash used in operating activities:		
Stock-based compensation expense	9,407	4,775
Depreciation expense	3,831	4,422
Net amortization of premiums and discounts on investments	(1,107)	1,172
Loss on disposal of property and equipment	—	75
Changes in operating assets and liabilities:		
Taxes receivable	16,737	—
Prepaid expenses and other current assets	873	(17,416)
Other non-current assets	—	(266)
Accounts payable	562	373
Accrued expenses and other current liabilities	(1,443)	4,120
Deferred revenue—related party	(65,201)	(71,644)
Deferred rent	107	(156)
Net cash used in operating activities	(63,613)	(90,988)
Investing activities:		
Purchases of investments	(252,918)	(179,874)
Proceeds from maturities of investments	336,694	141,322
Proceeds from sales of investments	3,997	15,638
Purchases of property and equipment	(1,359)	(15,107)
Net cash provided by (used in) investing activities	86,414	(38,021)
Financing activities:		
Proceeds from initial public offering of common stock, net of issuance costs	—	107,008
Proceeds from exercise of stock options	1,546	462
Net cash provided by financing activities	1,546	107,470
Net increase (decrease) in cash, cash equivalents and restricted cash	24,347	(21,539)
Cash, cash equivalents and restricted cash, beginning of period	24,829	46,368
Cash, cash equivalents and restricted cash, end of period	$ 49,176	$ 24,829
Non-cash investing and financing activities:		
Purchases of property and equipment in accounts payable and accrued expenses	$ 31	$ 170
Supplemental cash flow information:		
Cash paid for income taxes	$ —	$ 16,750

The accompanying notes are an integral part of these consolidated financial statements.

Jounce Therapeutics, Inc.
Notes to Consolidated Financial Statements

1. Nature of Business

Jounce Therapeutics, Inc. (the "Company") is a clinical-stage immunotherapy company dedicated to transforming the treatment of cancer by developing therapies that enable the immune system to attack tumors and provide long-lasting benefits to patients. The Company is subject to a number of risks similar to those of other clinical-stage immunotherapy companies, including dependence on key individuals; the need to develop commercially viable products; competition from other companies, many of which are larger and better capitalized; and the need to obtain adequate additional financing to fund the development of its products.

On February 1, 2017, the Company closed its initial public offering ("IPO") of 7,319,750 shares of the Company's common stock at a public offering price of $16.00 per share, including 954,750 shares of common stock issued upon the full exercise by the underwriters of their option to purchase additional shares. The gross proceeds from the IPO were $117.1 million and net proceeds were $106.4 million, after deducting underwriting discounts and commissions and other offering expenses paid by the Company.

Upon completion of the IPO, all outstanding preferred stock was automatically converted into an aggregate of 22,283,690 shares of common stock. In connection with the IPO, the board of directors and the stockholders of the Company approved a one-for-3.69 reverse stock split of the Company's issued and outstanding common stock. The reverse stock split became effective on January 13, 2017. All share and per share amounts in the consolidated financial statements have been retroactively adjusted for all periods presented to give effect to the reverse stock split, including reclassifying an amount equal to the reduction in par value to additional paid-in capital.

As of December 31, 2018, the Company had cash, cash equivalents, and investments of $195.9 million. The Company expects that its existing cash, cash equivalents and investments will enable it to fund its expected operating expenses and capital expenditure requirements for at least 12 months from March 6, 2019, the filing date of this Annual Report on Form 10-K. The Company expects to finance its future cash needs through a combination of equity or debt financings and collaboration arrangements, including potential cash inflows from its Master Research and Collaboration Agreement (the "Celgene Collaboration Agreement") with Celgene Corporation ("Celgene").

2. Basis of Presentation and Summary of Significant Accounting Policies

Basis of Presentation and Consolidation

The accompanying consolidated financial statements have been prepared in accordance with the rules and regulations of the Securities and Exchange Commission (the "SEC") and generally accepted accounting principles in the United States of America ("GAAP") as found in the Accounting Standards Codification ("ASC") of the Financial Accounting Standards Board ("FASB"). These consolidated financial statements include the accounts of Jounce Therapeutics, Inc. and its wholly-owned subsidiary, Jounce Mass Securities, Inc., which was established in July 2016. All intercompany transactions and balances have been eliminated in consolidation.

Segment Information

Operating segments are defined as components of an enterprise about which separate discrete information is available for evaluation by the chief operating decision-maker in deciding how to allocate resources and assess performance. The Company and the Company's chief operating decision maker, the Company's chief executive officer, views the Company's operations and manages its business as a single operating segment. The Company operates only in the United States.

Use of Estimates

The preparation of financial statements in conformity with GAAP requires management to make estimates and assumptions that affect the amounts reported in the financial statements and accompanying notes. On an ongoing basis, the Company's management evaluates its estimates which include, but are not limited to, estimates related to revenue recognized under the Celgene Collaboration Agreement (including estimates of internal and external costs expected to be incurred to satisfy performance obligations), accrued expenses, stock-based compensation expense and income taxes. The Company bases its estimates on historical experience and other market specific or other relevant assumptions it believes to be reasonable under the circumstances. Actual results could differ from those estimates.

Fair Value of Financial Instruments

ASC 820, *Fair Value Measurement*, establishes a fair value hierarchy for instruments measured at fair value that distinguishes between assumptions based on market data (observable inputs) and the Company's own assumptions (unobservable inputs). Observable inputs are inputs that market participants would use in pricing the asset or liability based on market data obtained from sources independent of the Company. Unobservable inputs are inputs that reflect the Company's assumptions about the inputs that market participants would use in pricing the asset or liability, and are developed based on the best information available in the circumstances.

ASC 820 identifies fair value as the exchange price, or exit price, representing the amount that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants. As a basis for considering market participant assumptions in fair value measurements, ASC 820 establishes a three-tier fair value hierarchy that distinguishes between the following:

- Level 1 inputs are quoted prices (unadjusted) in active markets for identical assets or liabilities.
- Level 2 inputs are inputs other than quoted prices included within Level 1 that are observable for the asset or liability, either directly or indirectly.
- Level 3 inputs are unobservable inputs that reflect the Company's own assumptions about the assumptions market participants would use in pricing the asset or liability. Financial assets and liabilities are classified in their entirety based on the lowest level of input that is significant to the fair value measurement.

To the extent that the valuation is based on models or inputs that are less observable or unobservable in the market, the determination of fair value requires more judgment. Accordingly, the degree of judgment exercised by the Company in determining fair value is greatest for instruments categorized in Level 3. A financial instrument's level within the fair value hierarchy is based on the lowest level of any input that is significant to the fair value measurement.

Cash Equivalents

Cash equivalents are highly-liquid investments that are readily convertible into cash with original maturities of three months or less when purchased. These assets include investment in money market funds that invests in U.S. Treasury obligations.

Investments

Short-term investments consist of investments with maturities greater than ninety days and less than one year from the balance sheet date. Long-term investments consist of investments with maturities of greater than one year that are not expected to be used to fund current operations. The Company classifies all of its investments as available-for-sale securities. Accordingly, these investments are recorded at fair value. Realized gains and losses, amortization and accretion of discounts and premiums are included in other income, net. Unrealized gains and losses on available-for-sale securities are included in other comprehensive income as a component of stockholders' equity until realized.

Property and Equipment

Property and equipment is recorded at cost and consists of laboratory equipment, furniture and office equipment, computer equipment, leasehold improvements, and construction in progress. The Company capitalizes property and

equipment that is acquired for research and development activities and that has alternate future use. Expenditures for maintenance and repairs are recorded to expense as incurred, whereas major betterments are capitalized as additions to property and equipment. Leasehold improvements are depreciated over the lesser of their useful life or the term of the lease. Depreciation is calculated over the estimated useful lives of the assets using the straight-line method.

Impairment of Long-lived Assets

The Company reviews its property and equipment whenever events or changes in circumstances indicate that the carrying value of certain assets might not be recoverable and recognizes an impairment loss when it is probable that an asset's realizable value is less than the carrying value.

Revenue Recognition (Subsequent to Adoption of ASC 606)

Effective January 1, 2018, the Company adopted ASC 606, *Revenue from Contracts with Customers*. Under ASC 606, an entity recognizes revenue when its customer obtains control of promised goods or services, in an amount that reflects the consideration that the entity expects to receive in exchange for those goods or services. In applying ASC 606, the Company performs the following five steps: (i) identify the contract(s) with a customer; (ii) identify the promises and performance obligations in the contract; (iii) determine the transaction price; (iv) allocate the transaction price to the performance obligations in the contract; and (v) recognize revenue when (or as) the Company satisfies the performance obligations. The Company only applies the five-step model to contracts when it is probable that it will collect the consideration to which it is entitled in exchange for the goods or services it transfers to the customer. At contract inception, once the contract is determined to be within the scope of ASC 606, the Company assesses the goods or services promised within each contract, determines those that are performance obligations and assesses whether each promised good or service is distinct. The Company then recognizes as revenue the amount of the transaction price that is allocated to the respective performance obligation when (or as) the performance obligation is satisfied. See Note 3, "Celgene Collaboration Agreement", for further information on the application of ASC 606 to the Celgene Collaboration Agreement.

Revenue Recognition (Prior to Adoption of ASC 606)

Prior to January 1, 2018, the Company recognized revenue in accordance with ASC 605, *Revenue Recognition*. Revenue was recognized when all of the following criteria were met:

- persuasive evidence of an arrangement exists;
- delivery has occurred or services have been rendered;
- the seller's price to the buyer is fixed or determinable; and
- collectability is reasonably assured.

Amounts received prior to satisfying the revenue recognition criteria were recognized as deferred revenue in the Company's consolidated balance sheets. Amounts expected to be recognized as revenue within the twelve months following the balance sheet date were classified as deferred revenue, current. Amounts not expected to be recognized as revenue within the twelve months following the balance sheet date were classified as deferred revenue, net of current portion.

Multiple-Element Arrangements (Prior to Adoption of ASC 606)

Determination of Units of Accounting

When evaluating multiple-element arrangements pursuant to ASC 605-25, *Revenue Recognition—Multiple-Element Arrangements*, the Company considered whether the deliverables under the arrangement represented separate units of accounting. This evaluation required subjective determinations and required management to make judgments about the individual deliverables and whether such deliverables are separable from the other aspects of the contractual relationship. In determining the units of accounting, management evaluated certain criteria, including whether the deliverables had standalone value, based on the consideration of the relevant facts and circumstances for each arrangement. The consideration received was allocated among the separate units of accounting using the relative selling price method, and the applicable revenue recognition criteria were applied to each of the separate

units. Deliverables were considered separate units of accounting provided that: (i) the delivered item(s) had value to the customer on a standalone basis and (ii) if the arrangement included a general right of return relative to the delivered item(s), delivery or performance of the undelivered item(s) was considered probable and substantially in the control of the Company. In assessing whether an item had standalone value, the Company considered factors such as the research, manufacturing and commercialization capabilities of the collaboration partner and the availability of the associated expertise in the general marketplace. In addition, the Company considered whether the collaboration partner could use the deliverable(s) for their intended purpose without the receipt of the remaining element(s), whether the value of the deliverable was dependent on the undelivered item(s) and whether there were other vendors that can provide the undelivered element(s).

Under multiple-element arrangements, options were considered substantive if, at the inception of the arrangement, the Company was at risk as to whether the collaboration partner would choose to exercise the option. Factors that the Company considered in evaluating whether an option was substantive included the overall objective of the arrangement, the benefit the collaborator might obtain from the arrangement without exercising the option, the likelihood the option would be exercised, and the cost to exercise the option. When an option was considered substantive, the Company did not consider the option or item underlying the option to be a deliverable at the inception of the arrangement and the associated option fees were not included in the allocable arrangement consideration, assuming the option was not priced at a significant and incremental discount. When an option was not considered substantive, the Company would consider the option, including other deliverables contingent upon the exercise of the option, to be a deliverable at the inception of the arrangement and a corresponding amount would be included in the allocable arrangement consideration. In addition, if the price of the option included a significant incremental discount, the discount inherent in the option price would be included as a deliverable at the inception of the arrangement.

Allocation of Arrangement Consideration

Arrangement consideration that is fixed or determinable was allocated among the separate units of accounting using the relative selling price method. Then, the applicable revenue recognition criteria in ASC 605-25 were applied to each of the separate units of accounting in determining the appropriate period and pattern of recognition. The Company determined the selling price of a unit of accounting following the hierarchy of evidence prescribed by ASC 605-25. Accordingly, the Company determined the estimated selling price for units of accounting within each arrangement using vendor-specific objective evidence (“VSOE”) of selling price, if available, third-party evidence (“TPE”) of selling price if VSOE is not available, or best estimate of selling price (“BESP”) if neither VSOE nor TPE is available. The Company typically used BESP to estimate the selling price, since it generally did not have VSOE or TPE of selling price for its units of accounting. Determining the BESP for a unit of accounting required significant judgment. In developing the BESP for a unit of accounting, the Company considered applicable market conditions and relevant entity-specific factors, including factors that were contemplated in negotiating the agreement with the customer and estimated costs. The Company validated the BESP for units of accounting by evaluating whether changes in the key assumptions used to determine the BESP would have a significant effect on the allocation of arrangement consideration between multiple units of accounting.

Patterns of Recognition

The Company recognized arrangement consideration allocated to each unit of accounting when all of the revenue recognition criteria in ASC 605 were satisfied for that particular unit of accounting. The Company recognized revenue associated with substantive options upon exercise of the option if the underlying license had standalone value from the other deliverables to be provided subsequent to delivery of the license. If the license did not have standalone value, the amounts allocated to the license option would be combined with the related undelivered items as a single unit of accounting.

The Company recognized the revenue amounts associated with research and development services and other service related deliverables ratably over the associated period of performance. If there was no discernible pattern of performance or objectively measurable performance measures did not exist, then the Company recognized revenue under the arrangement on a straight-line basis over the period the Company was expected to complete its performance obligations. If the pattern of performance in which the service is provided to the customer could be determined and objectively measurable performance existed, then the Company recognized revenue under the arrangement using the proportional performance method. Revenue recognized was limited to the lesser of the

cumulative amount of payments received and the cumulative amount of revenue earned, as determined using the straight-line method or proportional performance, as applicable, as of each reporting period.

Recognition of Milestones and Royalties

At the inception of an arrangement that included milestone payments, the Company evaluated whether each milestone was substantive and at risk to both parties on the basis of the contingent nature of the milestone. This evaluation included an assessment of whether (i) the consideration was commensurate with either the Company's performance to achieve the milestone or the enhancement of performance to achieve the milestone, (ii) the consideration related solely to past performance and (iii) the consideration was reasonable relative to all of the deliverables and payment terms within the arrangement. The Company evaluated factors such as clinical, regulatory, commercial and other risks that must be overcome to achieve the respective milestone and the level of effort and investment required to achieve the respective milestone in making this assessment. There was considerable judgment involved in determining whether a milestone satisfied all of the criteria required to conclude that a milestone was substantive. In accordance with ASC 605-28, *Revenue Recognition—Milestone Method*, clinical and regulatory milestones that were considered substantive would be recognized as revenue in their entirety upon successful accomplishment of the milestone, assuming all other revenue recognition criteria were met. Milestones that were not considered substantive would be recognized as revenue over the remaining period of performance, assuming all other revenue recognition criteria were met. Revenue from commercial milestones payments would be recorded as revenue upon achievement of the milestone, assuming all other recognition criteria were met.

Research and Development Expenses

Expenditures relating to research and development are expensed as incurred. Research and development expenses include external expenses incurred under arrangements with third parties, academic and non-profit institutions and consultants; salaries and personnel-related costs, including non-cash stock-based compensation expense; license fees to acquire in-process technology and other expenses, which include direct and allocated expenses for laboratory, facilities and other costs.

Intellectual Property Expenses

The Company expenses costs associated with intellectual property-related matters as incurred and classifies such costs as general and administrative expenses within the consolidated statements of operations.

Stock-based Compensation

The Company accounts for share-based payments in accordance with ASC 718, *Compensation—Stock Compensation.* ASC 718 requires all share-based payments to employees, including grants of employee stock options, restricted stock awards ("RSAs") and restricted stock units ("RSUs"), to be recognized as expense in the consolidated statements of operations based on their grant date fair values. For stock options granted to employees and to members of the Company's Board of Directors for their services on the Board of Directors, the Company estimates the grant date fair value of each stock option using the Black-Scholes option-pricing model. For RSUs and RSAs granted to employees, the Company estimates the grant date fair value of each award using intrinsic value, which is based on the value of the underlying common stock less any purchase price. For share-based payments subject to service-based vesting conditions, the Company recognizes stock-based compensation expense equal to the grant date fair value of share-based payment on a straight-line basis over the requisite service period.

The Black-Scholes option pricing model requires the input of certain subjective assumptions, including (i) the calculation of expected term of the share-based payment, (ii) the risk-free interest rate, (iii) the expected stock price volatility and (iv) the expected dividend yield. The Company uses the simplified method as proscribed by SEC Staff Accounting Bulletin No. 107 to calculate the expected term for stock options granted to employees as the Company does not have sufficient historical exercise data to provide a reasonable basis upon which to estimate the expected term. The Company determines the risk-free interest rate based on a treasury instrument whose term is consistent with the expected term of the stock options. Because there had been no public market for the Company's common stock prior to the IPO, there is a lack of Company-specific historical and implied volatility data. Accordingly, the Company bases its estimates of expected volatility on the historical volatility of a group of publicly-traded companies

with similar characteristics to itself, including stage of product development and therapeutic focus within the life sciences industry. Historical volatility is calculated over a period of time commensurate with the expected term of the share-based payment. The Company uses an assumed dividend yield of zero as the Company has never paid dividends on its common stock, nor does it expect to pay dividends on its common stock in the foreseeable future.

The Company accounts for forfeitures of all share-based payments when such forfeitures occur.

Income Taxes

Income taxes are recorded in accordance with ASC 740, *Income Taxes*, which provides for deferred taxes using an asset and liability approach. The Company recognizes deferred tax assets and liabilities for the expected future tax consequences of events that have been included in the consolidated financial statements or tax returns. Deferred tax assets and liabilities are determined based on the difference between the financial statement and tax bases of assets and liabilities using enacted tax rates in effect for the year in which the differences are expected to reverse. A valuation allowance against deferred tax assets is recorded if, based on the weight of the available evidence, it is more likely than not that some or all of the deferred tax assets will not be realized.

The Company accounts for uncertain tax positions using a more-likely-than-not threshold for recognizing and resolving uncertain tax positions. The evaluation of uncertain tax positions is based on factors, including, but not limited to, changes in the law, the measurement of tax positions taken or expected to be taken in tax returns, the effective settlement of matters subject to audit, new audit activity and changes in facts or circumstances related to a tax position.

Comprehensive Loss

Comprehensive loss is comprised of net loss and other comprehensive income. Other comprehensive income for all periods presented consists solely of unrealized gains on available-for-sale securities.

Net Loss per Share

Basic net loss per share is calculated by dividing net loss attributable to common stockholders by the weighted average number of share common shares outstanding during the period. Diluted net loss per share is calculated by dividing the net loss attributable to common stockholders by the weighted-average number of common equivalent shares outstanding for the period, including any dilutive effect from convertible preferred stock, outstanding stock options, unvested RSAs or unvested RSUs.

The Company follows the two-class method when computing net loss per share for periods when issued shares that meet the definition of participating securities are outstanding. The two-class method calls for the calculation of net loss per share for each class of common and participating securities according to dividends declared or accumulated and participation rights in undistributed earnings. The two-class method requires income available to common stockholders to be allocated between common and participating securities based upon their respective rights to received dividends as if all income for the period had been distributed. Net losses are not allocated to the Company's preferred stockholders as they do not have an obligation to share in the Company's net losses.

Concentrations of Credit Risk and Off-Balance Sheet Risk

Financial instruments that potentially expose the Company to concentrations of credit risk primarily consist of cash, cash equivalents and investments. The Company maintains its cash and cash equivalent balances with high-quality financial institutions and, consequently, the Company believes that such funds are subject to minimal credit risk. The Company's cash equivalents and investments are comprised of money market funds that are invested in U.S. Treasury obligations, corporate debt securities, U.S. Treasury obligations and government agency securities. Credit risk in these securities is reduced as a result of the Company's investment policy to limit the amount invested in any single issuer and to only invest in securities of a high credit quality.

The Company has no significant off-balance sheet risk such as foreign exchange contracts, option contracts or other foreign hedging arrangements.

Recent Accounting Pronouncements

In May 2014, the FASB issued Accounting Standards Update ("ASU") 2014-09, *Revenue from Contracts with Customers (Topic 606)*, which supersedes all existing revenue recognition requirements, including most industry-specific guidance. The new standard requires a company to recognize revenue when it transfers goods or services to customers in an amount that reflects the consideration that the company expects to receive for those goods or services. This guidance was originally effective for interim and annual periods beginning after December 15, 2016 and allowed for adoption using a full retrospective method, or a modified retrospective method. Subsequent to the issuance of ASU 2014-09, the FASB also issued the following updates related to ASC 606:

- In August 2015, the FASB issued ASU 2015-14, *Revenue from Contracts with Customers (Topic 606): Deferral of the Effective Date*, whereby the effective date for the new revenue standard was deferred by one year. As a result of ASU 2015-14, the new revenue standard is now effective for annual periods, and interim periods within those annual periods, beginning after December 15, 2017, and early adoption was permitted for annual periods beginning after December 15, 2016, including interim periods within that annual period.
- In March 2016, the FASB issued ASU 2016-08, *Revenue from Contracts with Customers (Topic 606): Principal versus Agent Considerations (Reporting Revenue Gross versus Net)*, to clarify the implementation guidance on principal versus agent considerations.
- In April 2016, the FASB issued ASU 2016-10, *Revenue from Contracts with Customers (Topic 606): Identifying Performance Obligations and Licensing*, to clarify the principle for determining whether a good or service is "separately identifiable" from other promises in the contract and to clarify the categorization of licenses of intellectual property.
- In May 2016, the FASB issued ASU 2016-12, *Revenue from Contracts with Customers (Topic 606): Narrow-Scope Improvements and Technical Expedients*, to clarify guidance on transition, determining collectability, non-cash consideration and the presentation of sales and other similar taxes.
- In December 2016, the FASB issued ASU 2016-20, *Technical Corrections and Improvements to Topic 606, Revenue from Contracts with Customers*, that allows entities not to make qualitative disclosures about remaining performance obligations in certain cases, adds disclosure requirements for entities that elect certain optional exemptions and adds twelve additional technical corrections and improvements to the new revenue standard.

The Company adopted ASC 606 effective January 1, 2018 under the modified retrospective method. The modified retrospective method requires that the cumulative effect of initially applying ASC 606 be recognized as an adjustment to the opening balance of retained earnings or accumulated deficit of the annual period that includes the date of initial application. Accordingly, during the first quarter of 2018, the Company recorded an increase to the opening balance of accumulated deficit and a corresponding increase to deferred revenue of $46.9 million related to the Celgene Collaboration Agreement.

Additionally, the following tables present a summary of the amount by which each financial statement line item was affected as of and during the year ended December 31, 2018 by the application of ASC 606 as compared to ASC 605, the revenue recognition guidance that was in effect before this change in accounting principle (in thousands, except per share amounts):

	December 31, 2018		
	ASC 606	**ASC 605**	**Difference**
Deferred revenue, current—related party	$ 55,157	$ 42,174	$ 12,983
Deferred revenue, net of current portion—related party	$ 42,715	$ 22,844	$ 19,871
Total liabilities	$ 110,323	$ 77,469	$ 32,854
Accumulated deficit	$ (163,907)	$ (131,053)	$ (32,854)
Total stockholders' equity	$ 104,129	$ 136,983	$ (32,854)

	Year Ended December 31, 2018		
	ASC 606	ASC 605	Difference
Collaboration revenue—related party	$ 65,201	$ 51,142	$ 14,059
Net loss	$ (27,379)	$ (41,438)	$ 14,059
Net loss per share attributable to common stockholders, basic and diluted	$ (0.84)	$ (1.27)	$ 0.43

The application of ASC 606 did not have an impact on the Company's net cash used in operating activities for the year ended December 31, 2018, but did result in offsetting adjustments to net loss and the change in deferred revenue presented within the consolidated statement of cash flows for that period.

Both the cumulative adjustment of $46.9 million recorded upon the initial application of ASC 606 and the differences outlined above are primarily attributable to the transition from recognizing revenue on a straight-line basis over the estimated performance period for each unit of accounting, which was a permitted method of revenue recognition under ASC 605, to recognizing revenue based on the Company's pattern of performance for each performance obligation under ASC 606. As part of the adoption of ASC 606, the Company implemented new processes to objectively measure the performance under the Celgene Collaboration Agreement. See Note 3, "Celgene Collaboration Agreement", for further information on the application of ASC 606 to the Celgene Collaboration Agreement.

In February 2016, the FASB issued ASU 2016-02, *Leases (Topic 842)*, which requires a lessee to recognize assets and liabilities on the balance sheet for operating leases and changes many key definitions, including the definition of a lease. The new standard includes a short-term lease exception for leases with a term of 12 months or less, as part of which a lessee can make an accounting policy election not to recognize lease assets and lease liabilities. Lessees will continue to differentiate between finance leases (previously referred to as capital leases) and operating leases using classification criteria that are substantially similar to the previous guidance. In July 2018, the FASB also issued ASU 2018-11, *Leases (Topic 842): Targeted Improvements*, which permits entities to continue applying legacy guidance in ASC 840, *Leases*, including its disclosure requirements, in the comparative periods presented in the year that the entity adopts the new leasing standard. The new standard will be effective for annual reporting periods beginning after December 15, 2018, including interim periods within those annual reporting periods, and early adoption is permitted for public entities. The Company will adopt this new standard on January 1, 2019 using the transition method permitted by ASU 2018-11. The Company has identified the population of leases subject to this new guidance, and it expects to utilize the package of practical expedients outlined within ASC 842-10-65-1(f), the hindsight practical expedient outlined within ASC 842-10-65-1(g) and the practical expedient related to not separating nonlease components permitted by ASC 842-10-15-37. The Company expects to record lease assets and lease liabilities upon adoption of this guidance, and it is in the process of completing its calculation of these amounts.

In August 2016, the FASB issued ASU 2016-15, *Statement of Cash Flows (Topic 230): Classification of Certain Cash Receipts and Cash Payments*, which is intended to reduce diversity in practice in how entities present certain types of cash transactions in the statement of cash flows. This guidance also clarifies how the predominance principle should be applied when classifying cash receipts and cash payments that have attributes of more than one class of cash flows. This guidance became effective for annual reporting periods beginning after December 15, 2017, including interim periods within those annual reporting periods. Accordingly, the Company adopted ASU 2016-15 effective January 1, 2018, and there was not a material impact to the consolidated financial statements as a result of the adoption of this guidance.

In November 2016, the FASB issued ASU 2016-18, *Statement of Cash Flows (Topic 230): Restricted Cash*, which requires entities to show the change in the total of cash, cash equivalents, restricted cash and restricted cash equivalents within the statement of cash flows. As a result, entities no longer separately present transfers between unrestricted cash and restricted cash. This guidance became effective for annual reporting periods beginning after December 15, 2017, including interim periods within those annual reporting periods. Accordingly, the Company adopted ASU 2016-18 effective January 1, 2018 using a retrospective transition method, and there was not a material impact to the consolidated financial statements as a result of the adoption of this guidance. See Note 7, "Restricted Cash", for incremental disclosures associated with the adoption of ASU 2016-18.

In May 2017, the FASB issued ASU 2017-09, *Compensation—Stock Compensation (Topic 718): Scope of Modification Accounting*. This guidance is intended to provide clarity and reduce diversity in practice as to when changes to the terms or conditions of share-based payments are accounted for as modifications. Under this new guidance, entities are required to apply modification accounting if the fair value, vesting conditions or classification of the award changes. This guidance became effective for annual reporting periods beginning after December 15, 2017, including interim periods within those annual reporting periods, and early adoption was permitted. The guidance per ASU 2017-09 is to be adopted prospectively to an award modified on or after the adoption date. The Company adopted ASU 2017-09 effective January 1, 2018, and there was no impact to the consolidated financial statements as a result of the adoption of this guidance.

In June 2018, the FASB issued ASU 2018-07, *Compensation—Stock Compensation (Topic 718): Improvements to Nonemployee Share-Based Payment Accounting*. This guidance is intended to simplify the accounting for share-based payments to nonemployees by aligning it with the accounting for share-based payments to employees, with certain exceptions. This guidance will be effective for annual reporting periods beginning after December 15, 2018, including interim periods within those annual reporting periods, and early adoption is permitted. The Company does not anticipate a material impact to the consolidated financial statements as a result of the adoption of this guidance.

In August 2018, the FASB issued ASU 2018-13, *Fair Value Measurement (Topic 820): Disclosure Framework—Changes to the Disclosure Requirements for Fair Value Measurement,* which eliminates, adds and modifies certain disclosure requirements for fair value measurements. This guidance will be effective for annual reporting periods beginning after December 15, 2019, including interim periods within those annual reporting periods, and early adoption is permitted. More specifically, an entity is permitted to early adopt any removed or modified disclosure requirements immediately and delay adoption of additional disclosure requirements until the effective date of this guidance. The Company does not anticipate a material impact to the consolidated financial statements as a result of the adoption of this guidance.

In November 2018, the FASB issued ASU 2018-18, *Collaborative Arrangements (Topic 808): Clarifying the Interaction between Topic 808 and Topic 606*, which clarifies that certain transactions between participants in a collaborative arrangement should be accounted for under ASC 606 when the counterparty is a customer. In addition, ASU 2018-18 adds unit-of-account guidance to ASC Topic 808, *Collaborative Arrangements*, in order to align this guidance with ASC 606 and also precludes an entity from presenting consideration from a transaction in a collaborative arrangement as revenue from contracts with customers if the counterparty is not a customer for that transaction. This guidance will be effective for annual reporting periods beginning after December 15, 2019, including interim periods within those annual reporting periods, and early adoption is permitted. The Company is currently evaluating the potential impact that ASU 2018-18 may have on the consolidated financial statements.

3. Celgene Collaboration Agreement

In July 2016, the Company entered into the Celgene Collaboration Agreement. The primary goal of the collaboration is to co-develop and co-commercialize innovative biologic immunotherapies that either activate or suppress the immune system by binding to targets identified by leveraging the Company's Translational Science Platform. Under the Celgene Collaboration Agreement, the Company granted Celgene exclusive options to develop and commercialize the Company's lead product candidate, vopratelimab (formerly JTX-2011), and up to four early-stage programs, consisting of targets to be selected from a pool of certain B cell, T regulatory cell and tumor-associated macrophage targets. Additionally, Celgene has an exclusive option to develop and commercialize the Company's product candidate JTX-4014, an anti-PD-1 antibody, which, upon exercise of such option, will be a shared program that may be used by both parties in and outside of the collaboration. Prior to Celgene exercising any of its options, the Company is responsible for all research and development activities under the Celgene Collaboration Agreement.

The Company received a non-refundable upfront cash payment of $225.0 million in July 2016 upon the execution of the Celgene Collaboration Agreement. The Company also received $36.1 million from the sale of 10,448,100 shares of Series B-1 convertible preferred stock upon the execution of a Series B-1 Preferred Stock Purchase Agreement with Celgene, which shares converted into 2,831,463 shares of common stock upon the completion of the IPO. If Celgene elects to exercise any of the program options, Celgene will pay the Company an option-exercise fee of $10.0 million to $60.0 million that varies by program, with an aggregate of $182.5 million if Celgene exercises all six program options. The initial research term of the collaboration is four years, which can be extended, at Celgene's

option, annually for up to three additional years for additional consideration that ranges from $30.0 million to $45.0 million per year, for an aggregate of $120.0 million if the term is extended for an additional three years.

In January 2019, Celgene and Bristol-Myers Squibb Company ("BMS") announced an agreement under which Celgene will be acquired by BMS, subject to shareholder and regulatory approvals.

Worldwide Development Cost and U.S. Operating Profit and Loss Sharing

Upon the exercise of each program option, the parties will enter into a co-development and co-commercialization agreement ("Co-Co Agreements") or, in the case of JTX-4014, a license agreement ("JTX-4014 License Agreement") that governs the development and commercialization of the applicable program. Although the agreements will not be executed unless and until Celgene exercises an option, the parties have agreed to the terms of the Co-Co Agreements and the JTX-4014 License Agreement as part of the Celgene Collaboration Agreement.

Under the Co-Co Agreements and the JTX-4014 License Agreement, the Company will share with Celgene the U.S. profits or losses and development costs on such collaboration program as follows:

- The Company will retain 60 percent of the U.S. operating profits or losses arising from commercialization of vopratelimab, with 40 percent allocated to Celgene.
- The Company will retain 25 percent of the U.S. operating profits or losses arising from commercialization of the first program (the "Lead Program"), other than vopratelimab or JTX-4014, for which an IND is filed under the collaboration, with 75 percent allocated to Celgene. Celgene has a one-time right to substitute and swap the economics and governance of this program with that of another program for which it exercises an option (other than vopratelimab and JTX-4014).
- The Company and Celgene will equally share U.S. operating profits or losses arising from commercialization of up to three additional programs (other than vopratelimab, JTX-4014 or the Lead Program) (the "Other Programs").
- The Company and Celgene will share all development costs, other than for JTX-4014, in accordance with the applicable Co-Co Agreements, of which Celgene's portion of the costs range from 67 percent to 85 percent.

If Celgene exercises its option for a program other than JTX-4014, the Company will enter into a Co-Co Agreement, pursuant to which Celgene will have the exclusive right to develop and commercialize the products arising out of such collaboration program outside of the United States, and the Company will be eligible to receive tiered royalties ranging from a high single digit to mid-teen percentage rate on net product sales outside of the United States. Under each Co-Co Agreement, the Company will also have the right to opt out of profit sharing and instead receive milestones and royalties.

Furthermore, if Celgene exercises its option for JTX-4014, the Company will enter into the JTX-4014 License Agreement, pursuant to which Celgene and the Company will each have equal rights to develop and commercialize JTX-4014 in combination with other proprietary molecules in their or the Company's respective pipelines or in combination with products arising out of collaboration programs. Subject to terms specified in the license agreement for JTX-4014, the party owning the proprietary molecule that is combined with JTX-4014, if such molecule does not arise from a collaboration program with Celgene, will be solely responsible for all development and commercialization costs related to such combination. If JTX-4014 is combined with a product arising from a collaboration program, then the parties will share costs and, if co-packaged or co-formulated, profits or losses in accordance with the Co-Co Agreements for such other product.

Milestones and Royalties

Under the Co-Co Agreements and the JTX-4014 License Agreement, Celgene is required to pay the Company for specified development, regulatory and commercial milestones, if achieved, up to approximately $2.3 billion, across all collaboration programs. The development milestones are payable on initiation of certain clinical trials and range from $32.5 million to $105.0 million, per program, with an aggregate total of $290.0 million. The regulatory approval milestones are payable upon regulatory approval in the United States and outside the United States and range from $7.5 million to $50.0 million per milestone, with an aggregate total of $700.0 million. The commercial milestones are payable upon achievement of specified aggregate product sales outside the United States for each program and range from $40.0 million to $200.0 million per milestone, with an aggregate total of $1.270 billion. The Company is also eligible to receive royalties on product sales outside the United States ranging from high single digit to mid-teen royalties.

Exercise of Options

Celgene may exercise its option for a program at any time until the expiration of an option term for that program. For each program, the option term ends 45 to 60 days following Celgene's receipt of a data package that includes certain information relating to the program's research and development activities. The data package for a program may be delivered to Celgene after the applicable development milestone for such program has been achieved. Depending on the program, the applicable development milestone is (i) IND acceptance, (ii) availability of certain Phase 1a data or (iii) availability of certain Phase 1/2 data. If Celgene fails to exercise its option during the option term for a program, the Company will continue to retain all rights to such program. If Celgene exercises its option for a program other than JTX-4014, then the Company will enter into a Co-Co Agreement with Celgene for such program in substantially the form attached to the agreement as an exhibit.

Under the Co-Co Agreement for vopratelimab and one additional program for which Celgene opts in, other than JTX-4014, the Company will be responsible for leading development and commercialization activities in the United States and Celgene will be responsible for development and commercialization activities outside the United States. For all other additional programs for which Celgene opts in, other than JTX-4014, Celgene will lead development and commercialization activities worldwide.

If Celgene exercises its option for JTX-4014, the Company and Celgene will enter into a license agreement, in substantially the form attached to the agreement as an exhibit, pursuant to which the Company and Celgene will both be able to equally access JTX-4014 for combinations within each other's portfolios and with other molecules that are subject to the agreement, subject to joint governance. Once Celgene opts in with respect to a given program, Celgene and the Company must each use commercially reasonable efforts to develop and commercialize the corresponding product in the United States.

Termination

At any point during the Celgene Collaboration Agreement, including during the research, development and clinical trial process, or during the term of the applicable co-development and co-commercialization or license agreement, respectively, Celgene can terminate the applicable agreement with the Company in its entirety, or with respect to any program under the Celgene Collaboration Agreement, upon 120 days' notice and can terminate the entire agreement with the Company in connection with a material breach of the agreement by the Company that remains uncured for 90 days.

Exclusivity

During the Celgene Collaboration Agreement's research term (i.e., for four years plus up to three one-year extensions that Celgene may elect), the Company may not alone, or with a third party, research, develop, manufacture or commercialize a biologic that binds to ICOS or a defined pool of B cell, T regulatory cell or tumor-associated macrophage targets that meet certain criteria, each termed a "Collaboration Exclusive Target", and inhibit, activate or otherwise modulate the activity of such Collaboration Exclusive Target. In addition, if Celgene exercises its option for a program within the Celgene Collaboration Agreement, other than JTX-4014, then until termination or expiration of the applicable Co-Co Agreement for such program, the Company may not directly or indirectly research, develop, manufacture or commercialize, outside of the Celgene Collaboration Agreement, any biologic with specified activity against that program's Collaboration Exclusive Target.

Accounting Analysis under ASC 606

Identification of the Contract(s)

The Company assessed the Celgene Collaboration Agreement and concluded that it represents a contract with a customer within the scope of ASC 606. The Company also concluded that each of the Co-Co Agreements and the JTX-4014 License Agreement, if executed in the future, would represent separate contracts apart from the Celgene Collaboration Agreement.

Identification of Promises and Performance Obligations

The Company determined that the Celgene Collaboration Agreement contains the following promises: (i) research and development services for the product candidate, vopratelimab ("Vopratelimab Research Services") (ii) research and development services for the product candidate, JTX-4014 ("JTX-4014 Research Services") (iii) research and development services associated with the Lead Program and Other Programs ("Lead and Other Programs Research Services"), (iv) research services associated with target screening ("Target Screening Services"), (v) non-transferable, limited sub-licensable and non-exclusive licenses to use the Company's intellectual property and the Company's rights in the collaboration intellectual property to conduct certain activities, on a program-by-program basis (the "Research Licenses"), (vi) various record-keeping and reporting requirements on a program-by-program basis, (vii) exclusivity provisions with respect to each Collaboration Exclusive Target and biologics binding to such Collaboration Exclusive Targets and (viii) establishment of and participation in a joint steering committee (the "JSC") and a joint patent committee (the "JPC"). The Company also evaluated the six program options as well as the research term extension options and concluded that none convey a material right to Celgene. Accordingly, neither the program options nor the research term extension options are considered to be promises within the Celgene Collaboration Agreement.

The Company assessed the above promises and concluded that each of the Vopratelimab Research Services, JTX-4014 Research Services, Lead and Other Programs Research Services and Target Screening Services are both capable of being distinct and distinct within the context of the Celgene Collaboration Agreement. Therefore, the Company has concluded that each of the Vopratelimab Research Services, JTX-4014 Research Services, Lead and Other Programs Research Services and Target Screening Services represent separate performance obligations.

The Company determined that the Research Licenses are not distinct within the context of the Celgene Collaboration Agreement as the Research Licenses allow Celgene to evaluate the results of the research and development services performed by the Company and the right to perform its duties under the Celgene Collaboration Agreement, but do not provide Celgene with any commercialization rights. Celgene can only benefit from the Research Licenses in conjunction with the related research and development services. Accordingly, the Research Licenses related to vopratelimab, JTX-4014 and the Lead and Other Programs have been combined with their respective research and development services performance obligations.

Similarly, the Company also determined that the various record-keeping and reporting requirements related to each program and the exclusivity provisions with respect to each Collaboration Exclusive Target and biologics binding to such Collaboration Exclusive Targets are not distinct within the context of the Celgene Collaboration Agreement. Accordingly, the various record-keeping and reporting requirements on a program-by-program basis and the exclusivity provisions with respect to each Collaboration Exclusive Target and biologics binding to such Collaboration Exclusive Targets have been combined with their respective research and development services performance obligations.

Finally, the Company assessed its participation in the JSC and the JPC and concluded that, while it does meet the definition of a performance obligation, it is both quantitatively and qualitatively immaterial in the context of the Celgene Collaboration Agreement. Accordingly, the Company has disregarded its participation in the JSC and the JPC as a performance obligation.

Determination of Transaction Price

As noted above, the Company received a non-refundable upfront cash payment of $225.0 million upon the execution of the Celgene Collaboration Agreement. This upfront payment represents an element of fixed consideration under the Celgene Collaboration Agreement. Celgene also purchased 10,448,100 shares of Series B-1 convertible preferred stock ("Series B-1 Preferred Stock") for gross proceeds of $36.1 million, which

shares converted into 2,831,463 shares of common stock upon the completion of the IPO. The Company determined the shares of Series B-1 Preferred Stock were sold at fair value. Therefore, the proceeds from the issuance of Series B-1 Preferred Stock did not impact the transaction price to be allocated to the performance obligations.

The Company evaluated as possible variable consideration the milestones, royalties, development cost sharing and profit sharing provisions discussed above. The Company concluded that none of these items represent variable consideration under the Celgene Collaboration Agreement as all such amounts are dependent upon the execution of a related Co-Co Agreement or the JTX-4014 License Agreement. The Co-Co Agreements and the JTX-4014 License Agreement, if executed in the future, would represent separate contracts apart from the Celgene Collaboration Agreement.

The Company also considered the existence of any significant financing component within the Celgene Collaboration Agreement given its upfront payment structure. Based upon this assessment, the Company concluded that any difference between the promised consideration and the cash selling price of the services under the Celgene Collaboration Agreement arises for reasons other than the provision of financing, and the difference between those amounts is proportional to the reason for the difference. Accordingly, the Company has concluded that the upfront payment structure of the Celgene Collaboration Agreement does not result in the existence of a significant financing component.

Based upon the above considerations, the Company has concluded that the transaction price associated with the Celgene Collaboration Agreement consists solely of the upfront payment of $225.0 million.

Allocation of Transaction Price to Performance Obligations

The Company has allocated the transaction price to each performance obligation on a relative standalone selling price basis. For all performance obligations, the Company determined the standalone selling price using estimates of the costs to perform the research and development services, including expected internal and external costs for services and supplies, adjusted to reflect a reasonable profit margin. The total estimated cost of the research and development services reflects the nature of the services to be performed and the Company's best estimate of the length of time required to perform the services.

Recognition of Revenue

The Company recognizes revenue related to the Celgene Collaboration Agreement over time as the services related to each performance obligation are rendered. The Company has concluded that an input method under ASC 606 is a representative depiction of the transfer of services under the Celgene Collaboration Agreement. The method of measuring progress towards delivery of the services incorporates actual internal and external costs incurred, relative to total internal and external costs expected to be incurred to satisfy the performance obligations. The period over which total costs are estimated reflects the Company's estimate of the period over which it will perform the research and development services to deliver a pre-defined data package to Celgene for each program subject to an option. The Company recognizes revenue for each performance obligation over periods ranging from twelve months to four years. Changes in estimates of total internal and external costs expected to be incurred are recognized in the period of change as a cumulative catch-up adjustment.

For the year ended December 31, 2018, the Company recognized collaboration revenue of $65.2 million under the Celgene Collaboration Agreement related to the $225.0 million upfront payment received in 2016. As of December 31, 2018, the Company has $97.9 million of deferred revenue, which is classified as either current or net of current portion in the accompanying consolidated balance sheets based on the period over which the revenue is expected to be recognized. This deferred revenue balance represents the aggregate amount of the transaction price allocated to the performance obligations that are partially unsatisfied as of December 31, 2018. The Company expects to recognize revenue related to these performance obligations through July 2020.

The following table presents changes in the Company's contract liabilities during the year ended December 31, 2018 (in thousands):

	Balance as of January 1, 2018	Additions	Reductions	Balance as of December 31, 2018
Contract liabilities:				
Deferred revenue	$ 163,073	$ —	$ (65,201)	$ 97,872
Totals	$ 163,073	$ —	$ (65,201)	$ 97,872

The reductions to the deferred revenue contract liability during the year ended December 31, 2018 were comprised of revenue recognized for research and development services performed, as well as a cumulative catch-up adjustment of $7.1 million arising from changes in costs estimated to be incurred under the Celgene Collaboration Agreement.

All revenue recognized during the year ended December 31, 2018 was included within the beginning balance of the deferred revenue contract liability.

As of December 31, 2018, the Company had not received any option exercise, research term extension, milestone or royalty payments under the Celgene Collaboration Agreement.

Accounting Analysis under ASC 605

Prior to January 1, 2018, the Company recognized revenue related the Celgene Collaboration Agreement in accordance with ASC 605. Under ASC 605, the Company determined that the Celgene Collaboration Agreement included six deliverables: (i) the Vopratelimab Research Services, (ii) the JTX-4014 Research Services, (iii) the Lead and Other Programs Research Services, (iv) the Target Screening Services, (v) the Research Licenses and (vi) participation in the JSC.

The six program options were considered substantive as the Company was at risk with regard to whether Celgene would exercise the options as a result of the significant uncertainties related to drug discovery, research and development given the significant development risk of the targets subject to the options. Additionally, there was also significant uncertainty regarding Celgene's exercise of the option for JTX-4014 because, although not a novel immunotherapy agent, the Company identified a significant development risk associated with its ability to advance the development of JTX-4014 in a commercially viable manner in a short time frame. The research term extensions were also considered substantive options based upon the risk that Celgene would exercise the research term extension. In addition, the substantial option exercise payments payable by Celgene upon exercise of each option were not priced at a significant and incremental discount. Accordingly, the substantive options were not considered deliverables at the inception of the arrangement and the associated option exercise payments were not included in allocable arrangement consideration. The Company also determined that any obligations contingent upon the exercise of a substantive option were not considered deliverables at the outset of the arrangement.

The Target Screening Services and participation in the JSC deliverables each had standalone value from the other undelivered elements and therefore were separate units of accounting. The Company determined that the research licenses for the vopratelimab and JTX-4014 programs did not have value to Celgene on a standalone basis primarily as a result of the fact that the research licenses allow Celgene to evaluate the results of the research and development services performed by the Company and the right to perform its duties under the agreement, but do not provide Celgene with any commercialization rights. Therefore, the Company determined that the research licenses did not have value to Celgene without the performance of the Vopratelimab Research Services and JTX-4014 Research Services and therefore were not separable from the Vopratelimab Research Services and JTX-4014 Research Services. The Vopratelimab Research Services were separate and distinct from the JTX-4014 Research Services, and therefore, the research license and the Vopratelimab Research Services were a separate combined unit of accounting and the research license and the JTX-4014 Research Services were a separate combined unit of accounting. The Lead and Other Programs Research Services deliverable did not include separate and distinct services and Celgene could use the Lead and Other Programs Research Services for its intended purpose without receipt of the research licenses that could be delivered for the Lead Program and Other Programs. The Lead and Other Programs Research Services therefore were combined with the licenses that could be

delivered for the Lead Program and Other Programs, which had an insignificant value, as a separate combined unit of accounting.

The allocable arrangement consideration consisted of the upfront fee of $225.0 million. As described above, Celgene also purchased 10,448,100 shares of Series B-1 Preferred Stock for gross proceeds of $36.1 million. The Company determined the shares of Series B-1 Preferred Stock were sold at fair value. Therefore, the proceeds from the issuance of Series B-1 convertible preferred stock did not have an impact on the arrangement consideration that was allocated to the units of accounting. The Company allocated the allocable arrangement consideration based on the relative selling price of each unit of accounting. For all units of accounting, the Company determined the selling price using BESP. The Company determined the BESP based on internal estimates of the costs to perform the services, including expected internal and external costs for services and supplies, adjusted to reflect a reasonable profit margin. The total cost of the research and development services reflected the nature of the services to be performed and the Company's best estimate of the length of time required to perform the services. The Company determined that the BESP of the participation in the JSC was insignificant and therefore no consideration was allocated to this unit of accounting. Therefore, the total allocable arrangement consideration was allocated to the Vopratelimab Research Services, the JTX-4014 Research Services, the Lead and Other Programs Research Services and the Target Screening Services.

The Company recognized the consideration allocated to each unit of accounting on a straight-line basis, as there was no discernible pattern or objective measure of performance of the services, over the estimated performance period. The estimated performance period reflected the Company's estimate of the period over which it would perform the separate and distinct research and development services to deliver a pre-defined data package to Celgene for each program subject to an option. The performance periods for each unit of accounting ranged from twelve months to four years.

The Company evaluated the milestones in the Celgene Collaboration Agreement, the Co-Co Agreements, and the JTX-4014 License Agreement to determine if they were substantive. In evaluating if a milestone was substantive, the Company assessed whether: (i) the consideration was commensurate with either the Company's performance to achieve the milestone or the enhancement of the value of the delivered item(s) as a result of a specific outcome resulting from the Company's performance to achieve the milestone, (ii) the consideration related solely to past performance and (iii) the consideration was reasonable relative to all of the deliverables and payment terms within the arrangement. All development and regulatory milestones in the Celgene Collaboration Agreement, the Co-Co Agreements and the JTX-4014 License Agreement were considered substantive on the basis of the contingent nature of the milestone, specifically reviewing factors such as the scientific, clinical, regulatory and other risks that must be overcome to achieve the milestone as well as the level of effort and investment required. Accordingly, the Company concluded that such amounts would be recognized in the period in which the associated milestone was achieved, assuming all other revenue recognition criteria were met. All commercial milestones would be accounted for in the same manner as royalties and recorded as revenue upon achievement of the milestone, assuming all other revenue recognition criteria were met.

Under ASC 605, the Company recognized collaboration revenue of $71.6 million for year ended December 31, 2017. As of December 31, 2017, the Company had $116.2 million of deferred revenue, which was classified as either "current" or "net of current portion" in the accompanying consolidated balance sheets based on the period over which the revenue was expected to be recognized.

4. Fair Value Measurements

The Company measures the fair value of money market funds, U.S. Treasuries and government agency securities based on quoted prices in active markets for identical securities. Investments also include corporate debt securities which are valued either based on recent trades of securities in inactive markets or based on quoted market prices of similar instruments and other significant inputs derived from or corroborated by observable market data.

The carrying amounts reflected in the consolidated balance sheets for cash, prepaid expenses and other current assets, accounts payable and accrued expenses approximate their fair values, due to their short-term nature.

Assets measured at fair value on a recurring basis as of December 31, 2018 were as follows (in thousands):

	Total	Quoted Prices in Active Markets for Identical Assets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
Money market funds, included in cash equivalents	$ 41,434	$ 41,434	$ —	$ —
Investments:				
Corporate debt securities	67,843	—	67,843	—
U.S. Treasuries	53,758	53,758	—	—
Government agency securities	32,829	32,829	—	—
Totals	$ 195,864	$ 128,021	$ 67,843	$ —

Assets measured at fair value on a recurring basis as of December 31, 2017 were as follows (in thousands):

	Total	Quoted Prices in Active Markets for Identical Assets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
Money market funds, included in cash equivalents	$ 21,059	$ 21,059	$ —	$ —
Investments:				
Corporate debt securities	65,173	—	65,173	—
U.S. Treasuries	110,948	110,948	—	—
Government agency securities	58,171	58,171	—	—
Totals	$ 255,351	$ 190,178	$ 65,173	$ —

There were no changes in valuation techniques or transfers between the fair value measurement levels during the years ended December 31, 2018 or 2017. There were no liabilities measured at fair value on a recurring basis as of December 31, 2018 or 2017.

5. Investments

Short-term investments consist of investments with maturities greater than ninety days and less than one year from the balance sheet date. Long-term investments consist of investments with maturities of greater than one year that are not expected to be used to fund current operations. The Company classifies all of its investments as available-for-sale securities. Accordingly, these investments are recorded at fair value. Realized gains and losses, amortization and accretion of discounts and premiums are included in other income, net. Unrealized gains and losses on available-for-sale securities are included in other comprehensive income as a component of stockholders' equity until realized.

Cash equivalents, short-term investments and long-term investments as of December 31, 2018 were comprised as follows (in thousands):

	December 31, 2018			
	Amortized Cost	Unrealized Gains	Unrealized Losses	Fair Value
Cash equivalents and short-term investments:				
Money market funds, included in cash equivalents	$ 41,434	$ —	$ —	$ 41,434
Corporate debt securities	65,887	2	(39)	65,850
U.S. Treasuries	53,765	1	(8)	53,758
Government agency securities	28,866	—	(34)	28,832
Total cash equivalents and short-term investments	189,952	3	(81)	189,874
Long-term investments:				
Corporate debt securities	2,001	—	(8)	1,993
Government agency securities	3,989	8	—	3,997
Total long-term investments	5,990	8	(8)	5,990
Total cash equivalents and investments	$ 195,942	$ 11	$ (89)	$ 195,864

Cash equivalents, short-term investments and long-term investments as of December 31, 2017 were comprised as follows (in thousands):

	December 31, 2017			
	Amortized Cost	Unrealized Gains	Unrealized Losses	Fair Value
Cash equivalents and short-term investments:				
Money market funds, included in cash equivalents	$ 21,059	$ —	$ —	$ 21,059
Corporate debt securities	58,136	—	(64)	58,072
U.S. Treasuries	111,049	—	(101)	110,948
Government agency securities	43,204	—	(131)	43,073
Total cash equivalents and short-term investments	233,448	—	(296)	233,152
Long-term investments:				
Corporate debt securities	7,117	—	(16)	7,101
Government agency securities	15,195	—	(97)	15,098
Total long-term investments	22,312	—	(113)	22,199
Total cash equivalents and investments	$ 255,760	$ —	$ (409)	$ 255,351

As of December 31, 2018 and 2017, the aggregate fair value of securities that were in an unrealized loss position for less than twelve months was $81.4 million and $113.9 million, respectively. As of December 31, 2018 and 2017, the aggregate fair value of securities that were in an unrealized loss position for more than twelve months was $22.3 million and $107.9 million, respectively. As of December 31, 2018, the Company did not intend to sell, and would not be more likely than not required to sell, the securities in an unrealized loss position before recovery of their amortized cost bases. Furthermore, the Company determined that there was no material change in the credit risk of these securities. As a result, the Company determined it did not hold any securities with any other-than-temporary impairment as of December 31, 2018.

There were immaterial realized gains and losses on available-for-sale securities during the years ended December 31, 2018 and 2017.

6. Prepaid Expenses and Other Current Assets

Prepaid expenses and other current assets as of December 31, 2018 and 2017 were comprised as follows (in thousands):

	December 31,	
	2018	2017
Prepaid expenses	$ 1,921	$ 2,196
Taxes receivable	—	16,737
Interest receivable on investments	414	969
Other current assets	—	43
Total prepaid expenses and other current assets	$ 2,335	$ 19,945

Taxes receivable decreased from December 31, 2017 to December 31, 2018 due to the Company's receipt of $16.8 million in federal and state income tax refunds during the year ended December 31, 2018.

7. Restricted Cash

As of both December 31, 2018 and 2017, the Company maintained non-current restricted cash of $1.3 million. This amount is included within "Other non-current assets" in the accompanying consolidated balance sheets and is comprised solely of a letter of credit required pursuant to the lease for the Company's corporate headquarters.

The following table provides a reconciliation of cash, cash equivalents and restricted cash that sums to the total of the same such amounts shown in the consolidated statements of cash flows (in thousands):

	Year Ended December 31, 2018		Year Ended December 31, 2017	
	Beginning of Period	End of Period	Beginning of Period	End of Period
Cash and cash equivalents	$ 23,559	$ 47,906	$ 44,848	$ 23,559
Restricted cash	1,270	1,270	1,520	1,270
Cash, cash equivalents and restricted cash	$ 24,829	$ 49,176	$ 46,368	$ 24,829

8. Property and Equipment, Net

Property and equipment, net as of December 31, 2018 and 2017 was comprised as follows (in thousands):

	Estimated Useful Life (in Years)	December 31,	
		2018	2017
Laboratory equipment	5	$ 10,435	$ 9,409
Furniture and office equipment	4	1,071	1,038
Computer equipment	3	1,505	1,380
Leasehold improvements	Shorter of useful life or remaining lease term	8,534	8,498
Total property and equipment, gross		21,545	20,325
Less: accumulated depreciation		(8,005)	(4,174)
Total property and equipment, net		$ 13,540	$ 16,151

Depreciation expense for the years ended December 31, 2018 and 2017 was $3.8 million and $4.4 million, respectively.

9. Accrued Expenses

Accrued expenses as of December 31, 2018 and 2017 were comprised as follows (in thousands):

	December 31,	
	2018	2017
Employee compensation and benefits	$ 4,063	$ 3,683
External research and professional services	2,796	4,647
Lab consumables and other	93	124
Total accrued expenses	$ 6,952	$ 8,454

10. Common Stock

The Company is authorized to issue 160,000,000 shares of common stock. Holders of common stock are entitled to one vote per share. Holders of common stock are entitled to receive dividends, if and when declared by the Board of Directors.

As of December 31, 2018 and 2017, the Company had reserved for future issuance the following number of shares of common stock (in thousands):

	December 31,	
	2018	2017
Shares reserved for vesting of restricted stock awards	7	16
Shares reserved for vesting of restricted stock units	371	—
Shares reserved for exercises of outstanding stock options	5,023	4,868
Shares reserved for future issuances under the 2017 Stock Option and Incentive Plan	1,114	1,032
Total shares reserved for future issuance	6,515	5,916

11. Preferred Stock

Series A Preferred Stock

At various closing dates during the years ended December 31, 2015, 2014 and 2013, the Company issued 47,000,000 shares of Series A convertible preferred stock ("Series A Preferred Stock") for $1.00 per share. The shares were issued in exchange for cash proceeds of $44.6 million, net of issuance costs of $0.1 million, and the exchange of approximately $2.3 million in outstanding convertible promissory notes, including accrued interest.

Series B Preferred Stock

During the year ended December 31, 2015, the Company issued 24,778,761 shares of Series B convertible preferred stock ("Series B Preferred Stock") for $2.26 per share. This issuance resulted in cash proceeds of $55.8 million, net of issuance costs of $0.2 million.

Series B-1 Preferred Stock

During the year ended December 31, 2016, the Company issued 10,448,100 shares of Series B-1 Preferred Stock to Celgene for $3.46 per share. This issuance resulted in cash proceeds of $36.1 million, net of issuance costs of $0.1 million.

Conversion of Preferred Stock Upon IPO

Prior to the Company's IPO, the holders of the Company's Series A Preferred Stock, Series B Preferred Stock and Series B-1 Preferred Stock had certain voting rights, dividend rights, liquidation preferences and conversion privileges. Upon completion of the Company's IPO, all shares of outstanding convertible preferred stock were automatically converted into an aggregate of 22,283,690 shares of common stock. All rights, preferences and privileges associated with the outstanding convertible preferred stock were terminated upon this conversion.

The Company is now authorized to issue 5,000,000 shares of undesignated preferred stock in one or more series. As of December 31, 2018, no shares of preferred stock were issued or outstanding.

12. Stock-based Compensation

2013 Stock Option and Grant Plan

In February 2013, the Company's Board of Directors adopted and the Company's stockholders approved the 2013 Stock Option and Grant Plan (the "2013 Plan"), as amended and restated, under which it could grant incentive stock options ("ISOs"), non-qualified stock options, RSAs and RSUs to eligible employees, officers, directors, and consultants. The 2013 Plan was subsequently amended in January 2015, April 2015, July 2015, March 2016 and October 2016 to allow for the issuance of additional shares of common stock.

2017 Stock Option and Incentive Plan

In January 2017, the Company's Board of Directors adopted and the Company's stockholders approved the 2017 Stock Option and Incentive Plan (the "2017 Plan"), which became effective immediately prior to the effectiveness of the Company's IPO. Upon the adoption of the 2017 Plan, no further awards will be granted under the 2013 Plan.

The 2017 Plan provides for the grant of ISOs, non-qualified stock options, RSAs, RSUs, stock appreciation rights and other stock-based awards. The Company's employees, officers, directors and consultants and advisors are eligible to receive awards under the 2017 Plan. The terms of awards, including vesting requirements, are determined by the Board of Directors, subject to the provisions of the 2017 Plan.

The Company initially registered 1,753,758 shares of common stock under the 2017 Plan, which was comprised of (i) 1,510,000 shares of common stock reserved for issuance under the 2017 Plan, plus (ii) 243,758 shares of common stock originally reserved for issuance under the 2013 Plan that became available for issuance under the 2017 Plan upon the completion of the Company's IPO. The 2017 Plan also provides that an additional number of shares will automatically be added to the shares authorized for issuance under the 2017 Plan on January 1, 2018 and each January 1st thereafter. The number of shares added each year will be equal to the lesser of (i) 4% of the outstanding shares on the immediately preceding December 31st or (ii) such amount as determined by the Compensation Committee of the Board of Directors. Effective January 1, 2018, 1,290,609 additional shares were automatically added to the shares authorized for issuance under the 2017 Plan.

As of December 31, 2018, there were 1,113,539 shares available for future issuance under the 2017 Plan.

2017 Employee Stock Purchase Plan

In January 2017, the Board of Directors adopted and the Company's stockholders approved the 2017 Employee Stock Purchase Plan (the "2017 ESPP"), which became effective upon the closing of the Company's IPO. The Company initially reserved 302,000 shares of common stock for future issuance under the 2017 ESPP. The 2017 ESPP also provides that an additional number of shares will automatically be added to the shares authorized for issuance under the 2017 ESPP on January 1, 2018 and each January 1st thereafter through January 1, 2027. The number of shares added each year will be equal to the lesser of (i) 1% of the outstanding shares on the immediately preceding December 31st, (ii) 603,000 shares or (iii) such amount as determined by the Compensation Committee of the Board of Directors. Effective January 1, 2018, 322,652 additional shares were automatically added to the shares authorized for issuance under the 2017 ESPP. No offering periods under the 2017 ESPP had been initiated as of December 31, 2018.

Stock-based Compensation Expense

Total stock-based compensation expense recognized in the consolidated statements of operations for the years ended December 31, 2018 and 2017 was as follows (in thousands):

	Year Ended December 31,	
	2018	2017
Research and development	$ 4,540	$ 2,840
General and administrative	4,867	1,935
Total stock-based compensation expense	$ 9,407	$ 4,775

Founder Awards

From December 2012 to February 2013, the Company issued 1,395,659 shares of restricted stock to non-employee founders (the "Founders"). Of the total restricted stock awarded to the Founders, 1,043,357 shares vested over one to four years, based on each Founder's continued service relationship with the Company in varying capacities as advisors, as prescribed by the grantee's individual restricted stock purchase agreements. The remaining 352,302 shares vested upon the determination by the Board of Directors of a Founder's achievement of certain performance objectives, as set forth in the agreements. These performance criteria were linked to certain milestones specific to the Company's research and development goals, including but not limited to preclinical and clinical development milestones related to the Company's product candidates. As of December 31, 2018, all restricted stock awards issued to Founders were vested.

Restricted stock awards granted to two Founders originally contained options that enabled the Founders to sell their vested shares back to the Company at fair value upon both (i) the termination of the consulting agreement between the Founder and the Company for any reason and (ii) the determination by the Founder's employer that the ownership of the restricted stock is in violation of the employer's conflict of interest policy. The occurrence of these events was determined to be outside of the Founders' and the Company's control. As such, these restricted stock awards were previously recorded on the consolidated balance sheet as contingently redeemable common stock, residing in temporary equity, in accordance with the classification guidance of ASC 718, *Compensation—Stock Compensation,* and ASC 480, *Distinguishing Liabilities from Equity*. In June 2017, the restricted stock purchase agreements related to the two Founders were amended such that these options expired on July 26, 2017. Accordingly, these restricted stock awards were reclassified from contingently redeemable common stock to additional paid-in capital as of that date.

RSA Activity

Pursuant to RSA agreements originally issued under the terms of the 2013 Plan, the Company, at its discretion, has the option to repurchase unvested shares underlying RSAs at the initial purchase price if the employees or non-employees terminate their service relationships with the Company. The shares underlying RSAs are recorded in stockholders' equity as they vest.

The following table summarizes RSA activity for the year ended December 31, 2018 (in thousands, except per share amounts):

	RSAs	Weighted-Average Grant Date Fair Value per Share
Unvested as of December 31, 2017	16	$ —
Issued	—	$ —
Vested	(9)	$ —
Repurchased	—	$ —
Unvested as of December 31, 2018	7	$ —

The aggregate fair value of RSAs that vested during the years ended December 31, 2018 and 2017, based upon the fair values of the stock underlying the RSAs on the day of vesting, was less than $0.1 million and $1.3 million, respectively.

RSU Activity

The Company has also granted RSUs to its employees under the 2017 Plan. The following table summarizes RSU activity for the year ended December 31, 2018 (in thousands, except per share amounts):

	RSUs	Weighted-Average Grant Date Fair Value per Share
Unvested as of December 31, 2017	—	$ —
Issued	388	$ 8.02
Vested	—	$ —
Cancelled	(17)	$ 8.02
Unvested as of December 31, 2018	371	$ 8.02

No RSUs vested during the years ended December 31, 2018 or 2017.

As of December 31, 2018, there was unrecognized stock-based compensation expense related to unvested RSUs of $2.4 million, which the Company expects to recognize over a weighted-average period of approximately 1.6 years.

Stock Option Activity

The fair value of stock options granted to employees and directors during the years ended December 31, 2018 and 2017 was calculated on the date of grant using the following weighted-average assumptions:

	Year Ended December 31,	
	2018	2017
Risk-free interest rate	2.7%	2.1%
Expected dividend yield	—%	—%
Expected term (in years)	6.0	6.1
Expected volatility	65.2%	70.1%

Using the Black-Scholes option pricing model, the weighted-average grant date fair value of stock options granted to employees and directors during the years ended December 31, 2018 and 2017 was $12.88 and $10.96 per share, respectively.

The following table summarizes changes in stock option activity during the year ended December 31, 2018 (in thousands, except per share amounts):

	Options	Weighted-Average Exercise Price	Weighted-Average Remaining Contractual Term (in years)	Aggregate Intrinsic Value
Outstanding at December 31, 2017	4,868	$ 6.28	7.9	$ 35,178
Granted	1,581	$ 21.15		
Exercised	(683)	$ 2.26		
Cancelled	(743)	$ 14.95		
Outstanding at December 31, 2018	5,023	$ 10.23	7.6	$ 3,133
Exercisable at December 31, 2018	2,733	$ 5.91	6.8	$ 3,014

The aggregate intrinsic value of stock options exercised during the years ended December 31, 2018 and 2017 was $5.7 million and $1.9 million, respectively.

As of December 31, 2018, there was unrecognized stock-based compensation expense related to unvested stock options of $19.7 million, which the Company expects to recognize over a weighted-average period of approximately 2.3 years.

13. Income Taxes

The provision for income taxes for the years ended December 31, 2018 and 2017 was comprised as follows (in thousands):

	Year Ended December 31,	
	2018	2017
Current taxes:		
Federal	$ —	$ —
State	46	36
Total current taxes	46	36
Deferred taxes:		
Federal	—	—
State	—	—
Total deferred taxes	—	—
Total provision for income taxes	$ 46	$ 36

The Tax Cuts and Jobs Act (the "Tax Act") was enacted on December 22, 2017 and introduced significant changes to United States income tax law. Among these changes, the federal statutory tax rate was reduced to 21%, net operating loss ("NOL") carrybacks are no longer permitted and NOLs generated in years beginning after December 31, 2017 may be carried forward indefinitely, subject to a limitation of 80% of taxable income.

In December 2017, the SEC staff issued Staff Accounting Bulletin No. 118 ("SAB 118") to address the application of GAAP in situations when a registrant does not have the necessary information available, prepared or analyzed (including computations) in reasonable detail to complete the accounting for certain income tax effects of the Tax Act. Due to the timing of the enactment and the complexity involved in applying the provisions of the Tax Act, the Company made reasonable estimates of the effects and recorded provisional amounts in its consolidated financial statements as of and for the year ended December 31, 2017. In accordance with SAB 118, the Company determined that the revaluation of its deferred tax assets and associated valuation allowance reduction of $9.4 million were provisional amounts as of December 31, 2017. The accounting for the tax effects of the Tax Act was completed during the year ended December 31, 2018, and no adjustments were made to these provisional amounts.

A reconciliation of the federal statutory income tax rate to the Company's effective tax rate is as follows:

	Year Ended December 31,	
	2018	2017
Income tax computed at federal statutory tax rate	21.0 %	34.0 %
Deferred tax effects from the Tax Act	— %	(57.2)%
State taxes, net of federal benefit	10.3 %	4.7 %
Tax credit carryforwards	12.2 %	26.8 %
Non-deductible income (expense)	— %	(4.9)%
Change in valuation allowance	(42.7)%	(1.8)%
Other	(1.0)%	(1.8)%
Effective tax rate	(0.2)%	(0.2)%

The principal components of the Company's deferred tax assets and liabilities as of December 31, 2018 and 2017 were comprised as follows (in thousands):

	December 31,	
	2018	2017
Deferred tax assets:		
Net operating loss carryforwards	$ 37,417	$ 26,926
Tax credit carryforwards	12,751	8,432
Deferred revenue	26,739	31,735
Deferred lease incentive	103	120
Deferred rent	476	431
Intangibles	552	237
Accrued expenses and other	1,091	995
Unrealized loss on available-for-sale securities	39	112
Stock-based compensation	2,119	713
Total deferred tax assets	81,287	69,701
Less: valuation allowance	(55,348)	(30,850)
Net deferred tax assets	25,939	38,851
Deferred tax liabilities:		
Section 481(a) method change	(25,653)	(38,481)
Depreciation	(286)	(370)
Total deferred tax liabilities	(25,939)	(38,851)
Net deferred taxes	$ —	$ —

The Company has incurred NOLs since inception. As of December 31, 2018, the Company had federal and state NOL carryforwards of $136.4 million and $138.7 million, respectively. Federal NOLs generated through the year ended December 31, 2017 expire at various dates from 2032 through 2037, and federal NOLs generated during the year ended December 31, 2018 may be carried forward indefinitely. State NOLs expire at various dates from 2032 through 2038. As of December 31, 2018, the Company had federal research and development tax credit carryforwards of $9.3 million which expire at various dates from 2032 through 2038. In addition, as of December 31, 2018, the Company had state research and development and investment tax credit carryforwards of $3.8 million and $0.6 million, respectively. The state research and development tax credit carryforwards expire at various dates from 2029 through 2033 and the state investment tax credit carryforwards expire at various dates from 2019 through 2021.

Management has evaluated the positive and negative evidence bearing upon the realizability of its deferred tax assets, which are principally comprised of NOL carryforwards, tax credit carryforwards, deferred revenue and stock-based compensation. Management has determined that it is more likely than not that the Company will not realize the benefits of its deferred tax assets, and as a result, a valuation allowance of $55.3 million has been established at December 31, 2018. The increase in the valuation allowance of $24.5 million during the year ended December 31, 2018 was primarily due to the increase in the deferred tax asset related to deferred revenue upon the adoption of ASC 606 as well as the additional operating loss generated by the Company.

NOL and tax credit carryforwards are subject to review and possible adjustment by the Internal Revenue Service ("IRS") and may become subject to an annual limitation in the event of certain cumulative changes in the ownership interest of significant shareholders over a three-year period in excess of 50% as defined under Sections 382 and 383 in the Internal Revenue Code ("IRC"). This could limit the amount of tax attributes that can be utilized annually to offset future taxable income or tax liabilities. The amount of the annual limitation is determined based on the Company's value immediately prior to the ownership change. An IRC Section 382 study, completed in August 2016, identified three previous ownership changes for purposes of IRC Section 382. As a result of these ownership changes, the Company's NOL and tax credit carryforwards allocable to the periods preceding each such ownership change are subject to limitations under IRC Section 382. Subsequent ownership changes may further affect the limitation in future years.

The Company had no unrecognized tax benefits as of either December 31, 2018 or 2017. During the year ended December 31, 2017, the Company completed a study of its research and development credit carryforwards generated during the years ended December 31, 2016 and 2015. The Company has not conducted a study of its research and development credit carryforwards generated during the year ended December 31, 2018. This study may result in an adjustment to the Company's research and development credit carryforwards; however, until a study is completed and any adjustment is known, no amounts are being presented as an uncertain tax position. A full valuation allowance has been provided against the Company's research and development credit carryforwards, and if an adjustment is required, this adjustment would be offset by an adjustment to the valuation allowance. Thus, there would be no impact to the consolidated statements of operations if an adjustment were required.

Interest and penalty charges, if any, related to income taxes would be classified as a component of the provision for income taxes in the consolidated statements of operations. As of December 31, 2018, the Company has not incurred any interest or penalty charges.

The Company files income tax returns in the United States federal tax jurisdiction and the Massachusetts state tax jurisdiction. Since the Company is in a loss carryforward position, it is generally subject to examination by federal and state tax authorities for all tax years in which a loss carryforward is available.

14. Related-party Transactions

In July 2016, the Company entered into the Celgene Collaboration Agreement and a Series B-1 Preferred Stock Purchase Agreement with Celgene. Under the Celgene Collaboration Agreement, the Company received a non-refundable upfront payment of $225.0 million. Under the Series B-1 Preferred Stock Purchase Agreement, Celgene purchased 10,448,100 shares of Series B-1 Preferred Stock for $36.1 million. These shares of Series B-1 Preferred Stock converted into 2,831,463 shares of common stock upon the completion of the Company's IPO. In addition, an affiliate of Celgene purchased 625,000 shares of the Company's common stock in the January 2017 IPO at the public offering price of $16.00 per share for a total of $10.0 million.

15. Commitments and Contingencies

Operating Leases

In November 2016, the Company entered into an operating lease agreement to occupy 51,000 square feet of laboratory and office space in Cambridge, Massachusetts. This facility serves as the Company's current corporate headquarters. The lease term began on November 1, 2016 and extends to March 31, 2025. The Company has the option to extend the lease term for one consecutive five-year period, at the market rate, by giving the landlord written notice of its election to exercise the extension at least twelve months prior to the original expiration of the lease term. The Company is recording rent expense on a straight-line basis through the end of the lease term and has recorded deferred rent on the consolidated balance sheets. The lease also provided the Company with a tenant improvement allowance of $0.5 million. The Company recorded the tenant improvement allowance as a deferred lease incentive and is amortizing the deferred lease incentive through a reduction of rent expense ratably over the lease term. Leasehold improvements related to this facility are being amortized over the shorter of their useful life or the lease term. The Company provided the landlord with a security deposit in the form of a letter of credit in the amount of $1.3 million, which is recorded as restricted cash in other non-current assets in the consolidated balance sheets.

As of December 31, 2018, the future minimum lease payments due under the operating lease for the Company's corporate headquarters are as follows (in thousands):

Years Ended December 31,	Minimum Lease Payments
2019	$ 4,260
2020	4,380
2021	4,505
2022	4,633
2023	4,764
2024 and thereafter	6,142
Total future minimum lease payments	$ 28,684

The Company leased its former corporate headquarters under an operating lease that was originally set to expire on October 15, 2018. Under this lease, the Company was recording rent expense on a straight-line basis through the end of the lease term and was recording deferred rent on the consolidated balance sheets. The lease also provided the Company with a tenant improvement allowance of $2.8 million. The Company was recording the tenant improvement allowance as a deferred lease incentive and was amortizing the deferred lease incentive through a reduction of rent expense ratably over the lease term. In March 2015, the Company entered into a three-year sublease agreement to lease additional lab and office facilities at the same location as its former corporate headquarters.

On May 19, 2017, the Company entered into a Lease Termination Agreement and a Sublease Termination Agreement (collectively, the "Lease Termination Agreements") with its landlord related to the leases for its former corporate headquarters. As a result of the Lease Termination Agreements, rental payments for the Company's former corporate headquarters ceased on May 31, 2017, with the exception of certain space that was utilized through August 31, 2017. The Lease Termination Agreements required the Company to pay an aggregate early termination fee of $0.7 million, which was paid in the second quarter of 2017. This early termination fee was recorded as a component of rent expense. In addition, the remaining deferred rent and deferred lease incentive balances related to the Company's former corporate headquarters were recognized in full as reductions of rent expense.

During the years ended December 31, 2018 and 2017, the Company recorded total rent expense of $4.0 million and $3.5 million, respectively.

License and Collaboration Agreements

The Company has entered into various license agreements for certain technology. The Company could be required to make aggregate technical, clinical development and regulatory milestone payments of up to $13.4 million and low single-digit royalty payments based on a percentage of net sales of licensed products. As of December 31, 2018, the Company had made $0.2 million in aggregate milestone payments under these license agreements. The Company may cancel these agreements at any time by providing 30 to 90 days' notice to the licensors, and all payments not previously due would no longer be owed.

The Company has also entered into collaboration agreements with various third parties for research services and access to proprietary technology platforms. Under these collaboration agreements, the Company could be required to make aggregate technical, clinical development and regulatory milestones payments ranging from $12.5 million to $12.9 million per product candidate and low single-digit royalty payments based on a percentage of net sales on a product-by-product basis. As of December 31, 2018, the Company had made $0.5 million in aggregate milestone payments under these collaboration agreements.

16. 401(k) Savings Plan

The Company has a defined-contribution savings plan under Section 401(k) of the IRC (the "401(k) Plan"). The 401(k) Plan covers all employees who meet defined minimum age and service requirements and allows participants to defer a portion of their annual compensation on a pretax basis. Beginning on January 1, 2018, the Company matches 50% of an employee's 401(k) contributions up to a maximum of 6% of the participant's salary, subject to employer match limitations under the IRC. As such, the Company made $0.5 million in contributions to the 401(k) Plan for the year ended December 31, 2018. The Company did not make any contributions to the 401(k) Plan for the year ended December 31, 2017.

17. Net Loss per Share

For purposes of the diluted loss per share calculation, outstanding stock options, unvested RSAs and unvested RSUs are considered to be potentially dilutive securities, however the following amounts were excluded from the calculation of diluted net loss per share because their effect would be anti-dilutive (in thousands):

	Year Ended December 31,	
	2018	2017
Outstanding stock options	5,023	4,868
Unvested RSAs	7	16
Unvested RSUs	371	—
Total	5,401	4,884

EXHIBIT INDEX

Exhibit No.	Description of Exhibit
3.1	Fourth Amended and Restated Certificate of Incorporation of the Registrant (incorporated by reference to Exhibit 3.1 of the Registrant's Annual Report on Form 10-K (File No. 001-37998) filed March 8, 2018)
3.2	Amended and Restated Bylaws of the Registrant (incorporated by reference to Exhibit 3.2 of the Registrant's Annual Report on Form 10-K (File No. 001-37998) filed March 8, 2018)
4.1	Specimen Common Stock Certificate (incorporated by reference to Exhibit 4.1 of the Registrant's Registration Statement on Form S-1 (File No. 333-215372) filed December 30, 2016)
4.2	Amended and Restated Investors' Rights Agreement by and among the Registrant and certain of its stockholders, dated April 17, 2015 as amended (incorporated by reference to Exhibit 4.2 of the Registrant's Registration Statement on Form S-1 (File No. 333-215372) filed December 30, 2016)
10.1#	Jounce Therapeutics, Inc. 2017 Stock Option and Grant Plan and forms of award agreements thereunder (incorporated by reference to Exhibit 10.1 of the Registrant's Registration Statement on Form S-1/A (File No. 333-215372) filed January 17, 2017)
10.2#	Form of Restricted Stock Unit Award Agreement under 2017 Stock Option and Incentive Plan (for employees) (incorporated by reference to Exhibit 10.1 of the Registrant's Quarterly Report on Form 10-Q (File No. 001-37998) filed August 9, 2018)
10.3#	Jounce Therapeutics, Inc. 2013 Stock Option and Grant Plan and forms of award agreements thereunder (incorporated by reference to Exhibit 10.2 of the Registrant's Annual Report on Form 10-K (File No. 001-37998) filed March 8, 2018)
10.4#	Jounce Therapeutics, Inc. 2017 Employee Stock Purchase Plan, As Amended (incorporated by reference to Exhibit 10.1 of the Registrant's Quarterly Report on Form 10-Q (File No. 001-37998) filed November 13, 2017)
10.5#	Amended and Restated Non-Employee Director Compensation Policy (incorporated by reference to Exhibit 10.1 of the Registrant's Quarterly Report on Form 10-Q (File No. 001-37998) filed November 13, 2018)
10.6#	Amended and Restated Employment Agreement between Richard Murray and the Registrant, dated January 6, 2017 (incorporated by reference to Exhibit 10.4 of the Registrant's Registration Statement on Form S-1/A (File No. 333-215372) filed January 17, 2017)
10.7#	Amended and Restated Employment Agreement between Kim Drapkin and the Registrant, dated January 6, 2017 (incorporated by reference to Exhibit 10.5 of the Registrant's Registration Statement on Form S-1/A (File No. 333-215372) filed January 17, 2017)
10.8#	Amended and Restated Employment Agreement between Elizabeth Trehu and the Registrant, dated January 6, 2017 (incorporated by reference to Exhibit 10.6 of the Registrant's Registration Statement on Form S-1/A (File No. 333-215372) filed January 17, 2017)
10.9#	Employment Agreement between Hugh Cole and the Registrant, dated August 14, 2017 (incorporated by reference to Exhibit 10.8 of the Registrant's Annual Report on Form 10-K (File No. 001-37998) filed March 8, 2018)
10.10#	Form of Director Indemnification Agreement (incorporated by reference to Exhibit 10.12 of the Registrant's Registration Statement on Form S-1 (File No. 333-215372) filed December 30, 2016)
10.11#	Form of Officer Indemnification Agreement (incorporated by reference to Exhibit 10.13 of the Registrant's Registration Statement on Form S-1/A (File No. 333-215372) filed January 17, 2017)
10.12#	Senior Executive Cash Incentive Bonus Plan (incorporated by reference to Exhibit 10.14 of the Registrant's Registration Statement on Form S-1/A (File No. 333-215372) filed January 17, 2017)
10.13	Lease Agreement between ARE-770/784/790 Memorial Drive, LLC and the Registrant, dated November 1, 2016 (incorporated by reference to Exhibit 10.11 of the Registrant's Registration Statement on Form S-1 (File No. 333-215372) filed December 30, 2016)
10.14	Lease Termination Agreement by and between Cambridge 1030 Mass Ave, LLC (as successor in interest to HCP/LFREP Ventures I, LLC) and the Registrant, dated May 19, 2017 (incorporated by reference to Exhibit 10.1 of the Registrant's Current Report on Form 8-K (File No. 001-37998) filed May 23, 2017)
10.15	Sublease Termination Agreement by and between Manus Biosynthesis, Inc. and the Registrant, dated May 19, 2017 (incorporated by reference to Exhibit 10.2 to the Registrant's Current Report on Form 8-K (File No. 001-37998) filed May 23, 2017)
10.16†	Amended and Restated Exclusive License Agreement between Sloan Kettering Institute for Cancer Research, Memorial Sloan Kettering Cancer Center and Memorial Hospital for Cancer and the Registrant, dated September 28, 2015 (incorporated by reference to Exhibit 10.9 of the Registrant's Registration Statement on Form S-1 (File No. 333-215372) filed December 30, 2016)
10.17†	Master Research and Collaboration Agreement between Celgene Corporation, Celgene Rivot LLC and the Registrant, dated July 18, 2016 (incorporated by reference to Exhibit 10.10 of the Registrant's Registration Statement on Form S-1 (File No. 333-215372) filed December 30, 2016)
21.1*	List of Subsidiaries of the Registrant
23.1*	Consent of Ernst & Young LLP, Independent Registered Public Accounting Firm
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+	Certifications of Principal Executive Officer and 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*	The following materials from the Company's Annual Report on Form 10-K for the year ended December 31, 2018, formatted in eXtensible Business Reporting Language (XBRL): (i) Consolidated Balance Sheets, (ii) Consolidated Statements of Operations, (iii) Consolidated Statements of Comprehensive Loss, (iv) Consolidated Statements of Convertible Preferred Stock, Contingently Redeemable Common Stock and Stockholders' (Deficit) Equity, (v) Consolidated Statements of Cash Flows and (vi) Notes to Consolidated Financial Statements

* Filed herewith

\+ Furnished herewith

\# Indicates a management contract or any compensatory plan, contract or arrangement

† Confidential treatment granted as to portions of the exhibit. Confidential materials omitted and filed separately with the Securities and Exchange Commission pursuant to Rule 406 of the Securities Act of 1933, as amended.

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SIGNATURES

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.

JOUNCE THERAPEUTICS, INC.

Date: March 6, 2019

By: /s/ Richard Murray
Richard Murray, Ph.D.
President and Chief Executive Officer

Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed below by the following persons on behalf of the registrant and in the capacities and on the dates indicated.

Signature	Title	Date
/s/ Richard Murray Richard Murray, Ph.D.	President, Chief Executive Officer and Director (Principal Executive Officer)	March 6, 2019
/s/ Kim C. Drapkin Kim C. Drapkin	Treasurer and Chief Financial Officer (Principal Financial and Accounting Officer)	March 6, 2019
/s/ Perry A. Karsen Perry A. Karsen	Chairman of the Board of Directors	March 6, 2019
/s/ Barbara Duncan Barbara Duncan	Director	March 6, 2019
/s/ Cary G. Pfeffer Cary G. Pfeffer, M.D.	Director	March 6, 2019
/s/ J. Duncan Higgons J. Duncan Higgons	Director	March 6, 2019
/s/ Robert Kamen Robert Kamen, Ph.D.	Director	March 6, 2019
/s/ Robert Tepper Robert Tepper, M.D.	Director	March 6, 2019
/s/ Luis A. Diaz, Jr. Luis A. Diaz, Jr., M.D.	Director	March 6, 2019

Exhibit 21.1

Subsidiaries of the Registrant

Name	Jurisdiction of Organization	Percentage Ownership
Jounce Mass Securities, Inc.	Massachusetts	100%

Exhibit 23.1

Consent of Independent Registered Public Accounting Firm

We consent to the incorporation by reference in the following Registration Statements:

(1) Registration Statement (Form S-3 No. 333-223518) of Jounce Therapeutics, Inc.,
(2) Registration Statement (Form S-8 No. 333-215794) pertaining to the Jounce Therapeutics, Inc. 2013 Stock Option and Grant Plan, the Jounce Therapeutics, Inc. 2017 Stock Option and Incentive Plan and the Jounce Therapeutics, Inc. 2017 Employee Stock Purchase Plan, and
(3) Registration Statement (Form S-8 No. 333-223519) pertaining to the Jounce Therapeutics, Inc. 2017 Stock Option and Incentive Plan and the Jounce Therapeutics, Inc. 2017 Employee Stock Purchase Plan;

of our report dated March 6, 2019, with respect to the consolidated financial statements of Jounce Therapeutics, Inc. included in this Annual Report (Form 10-K) for the year ended December 31, 2018.

/s/ Ernst & Young LLP

Boston, Massachusetts
March 6, 2019

Exhibit 31.1

CERTIFICATIONS

I, Richard Murray, certify that:

1. I have reviewed this Annual Report on Form 10-K of Jounce Therapeutics, 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)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

a. Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

b. Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

c. Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

d. Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer 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 6, 2019

By: /s/ Richard Murray

Richard Murray, Ph.D.
President and Chief Executive Officer
(Principal Executive Officer)

Exhibit 31.2

CERTIFICATIONS

I, Kim C. Drapkin, certify that:

1. I have reviewed this Annual Report on Form 10-K of Jounce Therapeutics, 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)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

a. Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

b. Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

c. Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

d. Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer 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 6, 2019

By: /s/ Kim C. Drapkin

Kim C. Drapkin
Treasurer and Chief Financial Officer
(Principal Financial and Accounting Officer)

Exhibit 32.1

**CERTIFICATIONS OF CEO AND CFO PURSUANT TO 18 U.S.C. SECTION 1350,
AS ADOPTED PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002**

In connection with this Annual Report on Form 10-K of Jounce Therapeutics, Inc. (the "Company") for the year ended December 31, 2018, as filed with the Securities and Exchange Commission on the date hereof (the "Report"), each of the undersigned officers of the Company hereby certifies, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that to the best of her or his 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 results of operations of the Company.

Date: March 6, 2019 By: /s/ Richard Murray
Richard Murray, Ph.D.
President and Chief Executive Officer
(Principal Executive Officer)

Date: March 6, 2019 By: /s/ Kim C. Drapkin
Kim C. Drapkin
Treasurer and Chief Financial Officer
(Principal Financial and Accounting Officer)