ALDER BIOPHARMACEUTICALS INC
Form 10-K
February 26, 2018

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, 2017

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 001-36431

Alder BioPharmaceuticals, Inc.

(Exact name of Registrant as specified in its Charter)

Delaware (State or other jurisdiction of incorporation or organization)	90-0134860 (I.R.S. Employer Identification No.)
11804 North Creek Parkway South Bothell, WA (Address of principal executive offices)	 98011 (Zip Code)

Registrant's telephone number, including area code: (425) 205-2900

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

Title of Each Class	Name of Exchange on Which Registered
Common Stock, $0.0001 par value per share	The NASDAQ Stock Market LLC (The NASDAQ Global 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 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 and posted on its corporate Web site, if any, every Interactive Data File required to be submitted and posted 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 and post such files). YES NO

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

Indicate by check mark whether the Registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a smaller reporting company, or an emerging growth company. See the definition of "large accelerated filer", "accelerated filer", "smaller reporting company" and "emerging growth company" in Rule 12b-2 of the Exchange Act. (Check one):

Large accelerated filer	Accelerated filer
Non-accelerated filer (do not check if a smaller reporting company)	
	Smaller reporting company
	Emerging growth company

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act.

Indicate by check mark whether the Registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act). YES NO

The aggregate market value of the voting and non-voting common equity held by non-affiliates of the Registrant, based on the closing price of the Registrant's common stock on The NASDAQ Stock Market on June 30, 2017, the last business day of its most recently completed second fiscal quarter, was $521,188,657. Excludes an aggregate of 4,943,325 shares of the Registrant's common stock held as of such date by officers, directors and stockholders that the Registrant has concluded are or were affiliates of the Registrant. Exclusion of such shares should not be construed to

indicate that the holder of any such shares possesses the power, direct or indirect, to direct or cause the direction of the management or policies of the Registrant or that such person is controlled by or under common control with the Registrant.

The number of shares of Registrant's Common Stock outstanding as of February 21, 2018 was 67,844,820.

DOCUMENTS INCORPORATED BY REFERENCE

Part III incorporates information by reference from the Registrant's definitive proxy statement to be filed with the Securities and Exchange Commission pursuant to Regulation 14A, not later than 120 days after the end of the fiscal year covered by this Annual Report on Form 10-K, in connection with the Registrant's 2018 Annual Meeting of Stockholders (the "2018 Proxy Statement").

Alder BioPharmaceuticals, Inc.

Annual Report on Form 10-K

For the Year Ended December 31, 2017

INDEX

In this Annual Report on Form 10-K, “we,” “our,” “us,” “Alder,” and “the Company” refer to Alder BioPharmaceuticals, Inc. and, where appropriate, its consolidated subsidiaries. “Alder,” “Alder BioPharmaceuticals” and the Alder logo are the property of Alder BioPharmaceuticals, Inc. This report contains references to our trademarks and trade names and to trademarks and trade names belonging to other entities. Solely for convenience, trademarks and trade names referred to in this report may appear without the ® or ™ symbols, but such references are not intended to indicate, in any way, that their respective owners will not assert, to the fullest extent under applicable law, their rights thereto. We do not intend our use or display of other companies’ trademarks or trade names to imply a relationship with, or endorsement or sponsorship of us by, any other companies.

PART I

Forward-Looking Information

This Annual Report on Form 10-K contains forward-looking statements within the meaning of Section 27A of the Securities Act of 1933, as amended, and Section 21E of the Securities Exchange Act of 1934, as amended. Forward-looking statements are based on our management's beliefs and assumptions and on information currently available to our management. All statements other than statements of historical facts are "forward-looking statements" for purposes of these provisions, including those relating to future events or our future financial performance and financial guidance. In some cases, you can identify forward-looking statements by terminology such as "may," "might," "will," "should," "expect," "plan," "anticipate," "project," "believe," "estimate," "predict," "potential," "intend" or "continue," terms like these or other comparable terminology, and other words or terms of similar meaning in connection with any discussion of future operating or financial performance. These statements are only predictions. All forward-looking statements included in this Annual Report on Form 10-K are based on information available to us on the date hereof, and we assume no obligation to update any such forward-looking statements. Any or all of our forward-looking statements in this document may turn out to be wrong. Actual events or results may differ materially. Our forward-looking statements can be affected by inaccurate assumptions we might make or by known or unknown risks, uncertainties and other factors. We discuss many of these risks, uncertainties and other factors in this Annual Report on Form 10-K in greater detail under the heading "Item 1A—Risk Factors." We caution investors that our business and financial performance are subject to substantial risks and uncertainties.

Item 1. Business

Company Overview

We are a clinical-stage biopharmaceutical company that discovers, develops and seeks to commercialize therapeutic antibodies with the potential to meaningfully transform the treatment paradigm in migraine. All of our product candidates were discovered and developed by Alder scientists using our proprietary antibody technology platform coupled with a deliberate approach to design and select candidates with properties that we believe optimize the therapeutic potential for patients and commercial competitiveness.

We are focusing our resources and development efforts principally on eptinezumab (ALD403), our most advanced solely-owned product candidate, in order to maximize its therapeutic and commercial potential. Eptinezumab is being evaluated in a pivotal trial program for the prevention of migraine, with a Biologics License Application (BLA) submission to the U.S. Food and Drug Administration (FDA) planned for the second half of 2018. Migraine is a serious neurological disease affecting about 36 million people in the United States. Of that number, approximately 13

million people in the United States are candidates for a migraine prevention therapeutic. Of these candidates for migraine prevention, we estimate that there are between five million to seven million people living with episodic and chronic migraine who are the most highly impacted patients, and they typically experience eight or more migraine days per month. Current preventative migraine treatment options, available in the market today, are challenged by safety, efficacy and tolerability limitations. Epidemiologic studies suggest that approximately 38% of migraineurs would benefit from preventive therapies, but only 11% currently receive them. As a result, we believe there is a significant, unmet need for new treatment and prevention options. We plan to focus our initial commercialization efforts for eptinezumab on the approximately 3,000 headache specialists that see the largest number of these highly impacted patients. We estimate this U.S. market opportunity for eptinezumab is approximately $1.5 to $2.0 billion.

Eptinezumab is a genetically engineered monoclonal antibody inhibiting calcitonin gene-related peptide (CGRP), a small protein and a validated target that is understood to drive migraine initiation, maintenance and chronification. Designed to deliver a competitively differentiated approach to migraine prevention, we believe eptinezumab holds the potential to be a transformative therapeutic and meet a profound medical need, changing the migraine prevention treatment paradigm for physicians and patients living with migraine.

Our deliberate approach to engineering and developing eptinezumab is designed to provide a unique clinical profile that, after a single administration via an infusion procedure, provides rapid, effective and sustained migraine prevention. We believe that this clinical profile, as supported by data from our clinical trials, will present a potentially compelling value proposition for patients, physicians, payors and our stakeholders.

Eptinezumab is the only potent and selective anti-CGRP monoclonal antibody in clinical development delivered by infusion. We believe that eptinezumab's design, coupled with the infusion mode of administration, provides the following key benefits:

- High specificity and strong binding for rapid and sustained suppression of CGRP biology;
- Allows for the total dose to be immediately active to inhibit CGRP with 100% bioavailability; and

- Supervised medication administration has the potential to promote patient adherence while maximizing product control and consistency of delivery.

In our first Phase 3 pivotal trial, PRevention Of Migraine via Intravenous ALD403 Safety and Efficacy 1 (PROMISE 1) for the prevention of frequent episodic migraine, and our second Phase 3 pivotal trial, PRevention Of Migraine via Intravenous ALD403 Safety and Efficacy 2 (PROMISE 2) for the prevention of chronic migraine, eptinezumab has demonstrated:

1. Rapid: Suppression of migraine risk is achieved on the first day post infusion:
- On Day 1 post infusion, the risk of having a migraine was reduced by >50% versus baseline following a single administration
2. Effective: Significant days of migraine freedom attained within 1 month following a single administration
- Approximately 1 in 3 patients had a ≥75% reduction in migraine days within 1 month
- More than half of patients had a ≥50% reduction in migraine days within 1 month
3. Sustained: Migraine free days sustained for 3 months following a single administration
- ≥50% and ≥75% reductions in migraine days sustained through 3 months
- Average 15-17% of patients had no migraines for months 1 to 3
4. Safety and tolerability profile consistent with earlier eptinezumab studies

We plan to submit a BLA to the FDA for eptinezumab in the second half of 2018. The pivotal trial program, in support of our BLA submission, consists of PROMISE 1, PROMISE 2 and a single open-label Phase 3 clinical trial. PROMISE 1 commenced in October 2015 and is evaluating the safety and efficacy of eptinezumab once every 3 months for one year in 888 patients with episodic migraine, defined as four to 14 migraine days per month. PROMISE 2 commenced in November 2016 and is evaluating the safety and efficacy of eptinezumab once every 3 months for 6 months in 1,072 patients with chronic migraine, defined as 15 or more headache days per month, with diagnostic and therapeutic features of migraine being present on eight or more days per month. The open-label trial commenced in December 2016 and is evaluating the long-term safety and tolerability of eptinezumab once every 3 months for one year in approximately 120 patients with chronic migraine. On June 27, 2017, we announced top-line results from PROMISE 1, showing that eptinezumab met the primary and key secondary endpoints. On January 8, 2018, we announced top-line results from PROMISE 2, showing that eptinezumab met all primary and key secondary endpoints. We have completed enrollment in the open-label trial and expect to announce top-line results in the first half of 2018. We are also focused on executing key chemistry, manufacturing and controls, or CMC, activities supporting our BLA submission, including a pharmacokinetic comparability study to be completed in the second half of 2018 to ensure commercial readiness of supply upon launch.

Based on the strength of eptinezumab's clinical profile, supportive feedback we have received from the physician community, and the market potential for eptinezumab delivered via a 30 minute infusion, we have determined the most prudent use of our resources in the near-term is in support of our planned BLA submission. With respect to a subcutaneous route of administration, we believe it is potentially an important way to enhance the value of eptinezumab and will provide an update on our strategy and future plans for this route of administration after we receive confirmation from the FDA that our BLA submission has been accepted for filing.

Assuming eptinezumab administered via infusion is approved by the FDA, we plan to focus our initial commercialization efforts on procedure oriented headache specialists in the United States with a specialty sales force sizing of approximately 75 to 125. We believe that these headache specialists comprise neurologists, pain specialists and primary care physicians and treat the highest proportion of the five million to seven million highly impacted migraine patients described above. We estimate this group of headache specialists to number approximately 3,000 physicians. We believe these physicians have a stronger preference for eptinezumab delivered via infusion versus self-administered anti-CGRP options due to the strength of eptinezumab's clinical profile. These physicians utilize in-office procedures and have previously prescribed infusion therapies. We estimate that 94% of these physicians have

previously prescribed an infusion therapy for migraine or other conditions. They administer infusion therapies within practice, hospital, or free-standing infusion centers. They value patient adherence benefits associated with supervised medication administration and they have an infrastructure in place for patient flow, supply and reimbursement.

We are committed to commercializing eptinezumab in the United States as a migraine prevention therapy, and are focused on capturing the full commercial value of eptinezumab globally. We recognize the potential for strategic partnerships and/or other arrangements that bring additional capabilities and infrastructure, as well as value to the program. Thus, as a key component of our commercial readiness activities, we are actively reviewing options both globally and in the United States that will allow us to realize the full commercial potential of eptinezumab beyond what we can achieve on our own.

Our product candidate pipeline also includes ALD1910, a preclinical monoclonal antibody that targets pituitary adenylate cyclase-activating polypeptide-38 (PACAP-38). ALD1910 is undergoing investigational new drug (IND)-enabling studies for the prevention of migraine. PACAP-38 is a protein that is active in mediating the initiation of migraine, and we believe that ALD1910 holds potential as a treatment for migraineurs who have an inadequate response to therapeutics directed at CGRP or its receptor. Our

third pipeline candidate is clazakizumab, designed to block the pro-inflammatory cytokine IL-6. In May 2016, we licensed the exclusive worldwide rights for clazakizumab to Vitaeris, Inc., or Vitaeris, based in Vancouver, British Columbia. In November 2017 Alder and Vitaeris amended the license agreement for clazakizumab and Vitaeris and its shareholders, including Alder, entered into a strategic collaboration and purchase option agreement (the "option agreement") with a third party, CSL Limited, (CSL), an Australian entity, to expedite the development of clazakizumab as a therapeutic option for solid organ transplant rejection. Prior to the license to Vitaeris, clazakizumab completed two positive Phase 2b clinical trials establishing proof-of-concept in patients with rheumatoid arthritis.

Our Strategic Priorities

Our goal is to build an enduring biopharmaceutical company that discovers and selects monoclonal antibodies for development and commercialization that hold the potential to meaningfully transform current treatment paradigms and offer patients innovative therapies in indications with profound medical needs. Key strategic priorities for us to achieve that goal include:

- Continue to prioritize the clinical development activities of eptinezumab for the prevention of migraine. Our primary priority is continuing to efficiently progress the clinical development of eptinezumab as a preventative treatment for migraine, supporting our objective of a BLA submission with the FDA in the second half of 2018 and obtaining regulatory approval of eptinezumab at the earliest opportunity.
- Optimize the commercial potential of eptinezumab by commercializing it for the prevention of migraine. We are focused on capturing the full commercial value of eptinezumab globally. We intend to continue commercial readiness activities to support commercialization of eptinezumab in the United States as a migraine prevention therapy, subject to FDA approval. We initially plan to build a specialty sales force targeting the estimated 3,000 procedure oriented headache specialists in the United States to capture what we estimate is this approximately $1.5 to $2.0 billion U.S. market opportunity for eptinezumab. We recognize the potential for strategic partnerships and/or other arrangements that bring additional capabilities and infrastructure, as well as value to the program. Thus, as a key component of our commercial readiness activities, we are actively reviewing options both globally and in the United States that will allow us to realize the full commercial potential of eptinezumab beyond what we can achieve on our own.
- Enhance the value of eptinezumab by maximizing its differentiating properties and clinical profile. We may explore the initiation of one or more additional clinical trials of our infusion formulation to maximize the differentiated therapeutic and commercial profile of eptinezumab. With respect to a subcutaneous route of administration, we believe it is potentially a way to enhance the value of eptinezumab and will provide an update on our strategy and future plans for this route of administration after we receive confirmation from the FDA that our BLA submission has been accepted for filing.
- Progress the development of ALD1910 as an additional treatment option for migraine prevention. ALD1910 is our preclinical product candidate for the prevention of migraine. We believe that ALD1910 holds potential as a treatment for migraineurs who have an inadequate response to therapeutics directed at CGRP or its receptor and are advancing ALD1910 through IND-enabling toxicology studies to support an IND with the FDA.
- Leverage our proprietary antibody technology platform and deliberate design approach. We have brought together a group of world class scientists and drug developers that, when coupled with our proprietary technologies, allow us to discover, develop and commercialize antibody-based therapeutics that have the potential to change the lives of patients suffering from many types of disease. We intend to establish targeted commercialization and marketing capabilities for our products in the United States, and to discover and select candidates addressing areas of profound medical need and hold properties that we believe optimize the therapeutic potential for patients and commercial competitiveness.

Our Pipeline

Our product candidate pipeline is composed of candidates discovered and developed by Alder scientists using our proprietary antibody technology platform and a deliberate approach to design and select candidates to have properties that we believe optimize the therapeutic potential for patients and commercial competitiveness. Leveraging this platform, we select for antibody properties that we consider important in order to optimize safety, tolerability and efficacy, along with other properties that support reduced dosing volumes and frequency, time to onset of therapeutic effect, route of administration flexibility and other benefits.

We direct our pipeline efforts to treat central nervous system (CNS) diseases and pain where we believe there is a profound medical need and where a monoclonal antibody can offer an innovative and a best-in-class or first-in-class therapeutic option conveying safety and efficacy advantages compared to existing therapies. Our pipeline currently includes three internally discovered humanized monoclonal antibodies, as well as preclinical programs targeting additional indications that are in the discovery phase.

Eptinezumab

Overview

Eptinezumab, our most advanced solely owned product candidate, is a genetically engineered monoclonal antibody that inhibits CGRP for prevention of migraine. CGRP is a small protein and a validated biological target that is understood to drive migraine initiation, maintenance and chronification. Eptinezumab was discovered by Alder scientists and is the result of a deliberate process coupled with proprietary technologies to design a monoclonal antibody inhibiting CGRP that delivers a competitively differentiated profile and a unique clinical benefit to patients. We believe eptinezumab holds the potential to be a transformative therapeutic and meet a profound medical need, changing the migraine prevention treatment paradigm for physicians and patients living with migraine.

Eptinezumab is the subject of a pivotal trial program and has been successfully evaluated in multiple clinical trials, including two Phase 3 clinical trials. Our clinical data to date demonstrates that, after a single 30 minute administration via an infusion procedure, eptinezumab provided rapid, effective and sustained migraine prevention. Eptinezumab is the only potent and selective anti-CGRP monoclonal antibody in clinical development delivered by infusion. We believe that eptinezumab's design, coupled with the infusion mode of administration, provides the following key benefits:

- Very high specificity and strong binding for rapid and sustained suppression of CGRP biology;
- Allows for the total dose to be immediately active to inhibit CGRP with 100% bioavailability; and
- Supervised medication administration has the potential to promote patient adherence while maximizing product control and consistency of delivery.

In our first Phase 3 pivotal trial, PRevention Of Migraine via Intravenous ALD403 Safety and Efficacy 1 (PROMISE 1) for the prevention of frequent episodic migraine, and our second Phase 3 pivotal trial, PRevention Of Migraine via Intravenous ALD403 Safety and Efficacy 2 (PROMISE 2) for the prevention of chronic migraine, eptinezumab has demonstrated:

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- ≥50% and ≥75% reductions in migraine days sustained through 3 months
- Average 15-17% of patients had no migraines for months 1 to 3
4. Safety and tolerability profile consistent with earlier eptinezumab studies

We believe that the emerging profile of eptinezumab, with its potential to rapidly and significantly reduce the number of migraine days that patients experience, with benefit sustained for at least three months after a single administration, including the potential for patients to experience a 75% or greater reduction in migraine days and be 100% migraine free as demonstrated during our Phase 3 clinical trials, addresses key therapeutic needs of patients and physicians and competes favorably with existing treatments and other treatments currently in development. In addition to its favorable emerging safety and efficacy profile, we believe eptinezumab has the potential for advantageous dosing regimens requiring infusions no more often than quarterly.

About Migraine

Migraine is a highly symptomatic and debilitating neurological disease; approximately 36 million Americans live with migraine. In the United States, employers lose more than $13 billion each year as a result of 113 million lost work days due to migraine. Migraine is also a significant cause of emergency rooms visits, with estimates reaching over 1 million visits annually. Each year, spending for chronic migraine, including co-morbid conditions, is $41 billion and 88% of the chronic migraine patients have at least one co-morbid condition. The smaller sector of chronic migraine patients with four or more co-morbidities accounted for $28 billion of the $41 billion total.

Migraine is a multifaceted disease associated with a hyper-excitable nervous system resulting from the complex interplay between genetics and the environment. Migraine symptoms typically include sharp or throbbing head pain along with associated aura, such as disturbed vision, sensitivity to light, sound and smells, nausea and vomiting, mood changes and cognitive difficulties. Migraine starts as an episodic disorder but becomes chronic over time as the threshold for migraine initiation is reduced, resulting in an increased frequency of migraine attacks and little or no return to normal baseline nervous system function between episodes.

Of the 36 million people in the United States living with migraine, it is estimated that approximately 13 million are candidates for a preventative therapy, including two million with disabling episodic migraine and three million with chronic migraine, representing the most highly impacted segment of the migraine patient population.

Current Therapies. Currently, pharmacological treatment for migraine can be divided into abortive and preventive therapy. Abortive medications aim to reverse, or at least stop, the progression of a migraine once it has started. Preventive medications, which are given even in the absence of a migraine, aim to reduce the frequency and severity of the migraine attack, make acute attacks more responsive to abortive medications and may improve the patient's quality of life to a greater degree than abortive medications alone.

With some limitations and exceptions, FDA approved abortive medications are used successfully by many patients. However, for those patients living with migraine that are candidates for a preventative therapy, available treatments have limited efficacy, poor tolerability, or serious side-effects (or a combination of these) that limit patient use. Specifically, we believe that there is a need for migraine prevention therapies with improved safety and tolerability, efficacy and route of administration options to meet patient and physician needs. Both patients and physicians seek treatment options that significantly reduce the number of migraine days patients experience and are safe and well-tolerated. Additionally, how quickly the treatment prevents migraines is of particular importance to patients. Providing health care provider administered infusion therapy that allows for infrequent quarterly dosing is also important to physicians and patients to improve patient adherence while maximizing product control, consistency of delivery and patient adherence.

- Abortive Medications. Numerous abortive medications are used for migraine. The choice for an individual patient depends on the severity of the attacks, associated symptoms, such as severity of pain, incidence of nausea and vomiting, and the patient's treatment response. Patients most commonly use a non-steroidal anti-inflammatory drug, a 5-hydroxytryptamine–1 agonist, or triptan, or a combination of both to abort a migraine. Triptans are most effective when taken early during a migraine and may be repeated in two hours as needed, with a maximum of two doses daily. Triptans are not recommended for use more than three days a week because overuse can lead to increased frequency of migraines and medication overuse headache. Approximately 30% to 50% of patients respond to triptans but there is a high rate of recurrence of migraine within 24 hours. To avoid the development of medication overuse headache, patients are limited to no more than 10 doses of triptans a month, which may be insufficient to treat patients highly impacted with episodic or chronic migraines. This limitation can also be problematic for migraine patients who suffer from nausea and vomiting and cannot keep triptans in their systems. In addition to these limitations, triptans are also contraindicated for patients with existing, or at risk of, coronary artery disease.
- Preventive Medications. Currently, preventive medications approved for migraine include beta blockers (such as propranolol), topiramate, sodium valproate, and botulinum toxin, or Botox. In patients highly impacted with episodic and chronic migraine, beta blockers, topiramate and sodium valproate are commonly used. These medications are often not well-tolerated by many patients because of adverse events such as cognitive impairment, nausea, fatigue and sleep disturbance. In clinical trials, complete responses, or a 100% reduction in migraine days or episodes, with topiramate were less than 6%. In the affected patient population, predominantly women of child-bearing age, the association of these agents with poor pregnancy outcomes and fetal abnormalities can limit their use.

Botox is only approved in chronic migraine patients. Approximately 47% of Botox-treated patients experience a 50% reduction in either migraine days per month or migraine frequency per month within six months, which leaves more than half of patients inadequately treated. In Phase 3 clinical trials, Botox did not report any complete responses. In addition, the dosing regimen requires approximately 31 subcutaneous injections at various sites on the head and neck which is repeated every 12 weeks if the patient has a therapeutic response and it takes two cycles of treatment (24 weeks) to achieve full benefit.

Profound Unmet Medical Need. The utility of current preventative treatment options is challenged by limited efficacy and medication side-effects which often limit the use of migraine medications. According to the U.S. Agency for

Healthcare Research and Quality, only about 12% of adults with episodic or chronic migraine for whom preventive medications are indicated are currently taking preventive medications. Further, nearly 50% of migraineurs have not used a preventative therapy and 65% discontinue migraine medication because of side effects. As a result, we believe the area of profound unmet need in migraine is for preventive therapies with improved efficacy and tolerability to treat the individuals highly impacted by episodic and chronic migraine.

Indications for preventive migraine medications may include:

- frequency of migraine attacks greater than two per month with disability that lasts three or more days per month;
- abortive medications fail or are overused; or
- symptomatic medications (e.g. analgesics or anti-emetics) are contraindicated or ineffective.

We believe that highly impacted patients suffering from episodic and chronic migraine are highly motivated to seek new preventative treatment options that offer improved safety and tolerability, and better efficacy as measured by a material reduction in

the number of migraine days experienced, the rapidity with which the migraines are prevented, and infrequent dosing, as compared with current options, which have safety, tolerability and efficacy limitations. We believe that a therapeutic option that addresses these limitations represents a significant opportunity to improve disease management in a substantial number of patients that are candidates for migraine prevention.

Our Migraine Prevention Solution: CGRP and the Science of Eptinezumab. We are developing eptinezumab for the prevention of migraine, to meet the needs of the estimated 13 million patients in the United States living with migraine that are candidates for a preventative therapy option. Eptinezumab is a genetically engineered monoclonal antibody that inhibits CGRP, a small protein and a validated biological target that is understood to drive migraine initiation, maintenance and chronification. Eptinezumab was discovered by Alder scientists and is the result of a deliberate process coupled with proprietary technologies to design a monoclonal antibody inhibiting CGRP. It was designed to provide a competitively differentiated clinical profile to the migraine prevention treatment paradigm and deliver a unique clinical benefit to patients.

We believe eptinezumab holds the potential to be a transformative therapeutic and meet a profound medical need, changing the migraine prevention treatment paradigm for physicians and highly impacted patients living with episodic or chronic migraine. We are developing eptinezumab as a fast acting, highly potent, and long-acting therapeutic that modulates the activity of CGRP for the prevention of migraine in highly impacted patients with episodic or chronic migraine.

Other CGRP Directed Therapeutics. There are no currently approved medications that directly target CGRP. Early small molecule CGRP inhibitors established that blocking CGRP was effective as an abortive treatment for migraine. However, these small molecules, which have very different properties than eptinezumab, a monoclonal antibody, had side-effects and toxicity issues that curtailed their development. These experiences further clinically validated CGRP biology as a target for migraine but suggested a different strategy for intervention be used to avoid off-target toxicity issues. Based on prior experiences of other companies targeting the CGRP pathway and our own efficacy data in the prevention of episodic migraine and chronic migraine, we believe there is compelling rationale to continue the development of a highly selective antibody, such as eptinezumab, for the prevention of migraine. In clinical trials of eptinezumab to date, involving more than 2,600 subjects, we have not observed any significant side-effects or toxicity issues. As described under "—Competition—Eptinezumab," there are several other CGRP inhibiting therapies currently in development that could compete with eptinezumab.

Commercial Strategy

Assuming eptinezumab administered via infusion is approved by the FDA, we plan to focus our initial commercialization efforts on procedure oriented headache specialists in the United States with a specialty sales force sizing of approximately 75 to 125. We believe that these headache specialists comprise neurologists, pain specialists and primary care physicians and treat the highest proportion of the five million to seven million highly impacted patients described above. We estimate this group of headache specialists to number approximately 3,000 physicians. We believe these physicians have a stronger preference for eptinezumab delivered via infusion vs self-administered anti-CGRP options due to the strength of eptinezumab's clinical profile. These physicians utilize in-office procedures and have previously prescribed infusion therapies. We estimate that 94% of these physicians have previously prescribed an infusion therapy for migraine or other conditions. They administer infusion therapies within practice, hospital or free-standing infusion centers. They value patient adherence benefits associated with supervised medication administration and they have an infrastructure in place for patient flow, supply and reimbursement.

We are committed to commercializing eptinezumab in the United States as a migraine prevention therapy, and are focused on capturing the full commercial value of eptinezumab globally. We recognize the potential for strategic

partnerships and/or other arrangements that bring additional capabilities and infrastructure, as well as value to the program. Thus, as a key component of our commercial readiness activities, we are actively reviewing options both globally and in the United States that will allow us to realize the full commercial potential of eptinezumab beyond what we can achieve on our own.

Clinical Trials

Overview. We believe the clinical data obtained to date in our development program for eptinezumab exhibits the potential of eptinezumab to transform the preventative treatment paradigm for patients living with migraine. We have completed multiple clinical trials evaluating eptinezumab, including two Phase 2 trials in patients with migraine, and are currently evaluating eptinezumab in a pivotal trial program that encompasses two Phase 3 pivotal clinical trials and an open-label Phase 3 clinical trial. Further, we are exploring the initiation of one or more additional clinical studies of our infusion formulation that would, if successful, potentially enable us to broaden the initial label beyond that contemplated by our existing pivotal trials.

Pivotal Trial Program. We initiated our pivotal trial program for eptinezumab in October 2015 with PRevention Of Migraine via Intravenous ALD403 Safety and Efficacy 1 (PROMISE 1), a pivotal clinical trial evaluating the safety and efficacy of eptinezumab administered via infusion once every 12 weeks for one year in approximately 888 patients with frequent episodic migraine. PROMISE 1 is a double-blind, placebo-controlled Phase 3 clinical trial in which patients are randomized equally to either one of three doses of eptinezumab or placebo administered via infusion once every 12 weeks across sites in the United States and Europe. Patient recruitment for PROMISE 1 was completed in October 2016, and top-line six-month data from PROMISE 1 was

reported on June 27, 2017. In November 2016, Alder initiated a second pivotal clinical trial, PRevention Of Migraine via Intravenous ALD403 Safety and Efficacy 2 (PROMISE 2), evaluating the safety and efficacy of eptinezumab in patients with chronic migraine. This study is a double-blind, placebo-controlled Phase 3 clinical trial enrolling 1,072 patients randomized to either one of two dose levels of eptinezumab or placebo administered via infusion once every 12 weeks for six months across sites in the United States and Europe. We reported top-line three-month data from PROMISE 2 on January 8, 2018.

In December 2016, we initiated an open-label Phase 3 clinical trial of eptinezumab to further evaluate the long-term safety and tolerability of eptinezumab, as required by the FDA. This study is a Phase 3 clinical trial enrolling 120 patients to receive eptinezumab administered by infusion once every 12 weeks for one year. We expect data from this clinical trial to be available in the first half of 2018.

PROMISE 2 Top-Line Data (Chronic Migraine): This Phase 3 trial is a double-blind, placebo-controlled, randomized global trial evaluating the safety and efficacy of eptinezumab for chronic migraine prevention. In the study, 1,072 patients were randomized to receive eptinezumab (300mg or 100mg) or placebo administered via infusion once every 3 months for 6 months. To be eligible for the trial, patients must have experienced at least 15 headache days per month, of which at least eight met criteria for migraine. Patients that participated in the trial had an average of 16.1 migraine days per month at baseline. The primary endpoint was the mean change from baseline in monthly migraine days over the 12-week, double-blind treatment period. Secondary study endpoints assessed through 12 weeks included reduction from baseline (the daily mean migraine prevalence over the 28-day screening period) in daily migraine prevalence on Day 1 and Days 1-28 post-infusion, reductions of > 50%, >75%, and 100% from baseline in mean monthly migraine days, change from baseline in mean monthly acute migraine-specific (triptan or ergotamine) medication days, and reductions from baseline in patient-reported impact scores on the Headache Impact Test (HIT-6).

On January 8, 2018, we announced that eptinezumab met primary and all key secondary endpoints with very high statistical significance vs. placebo. The primary endpoint, demonstrating statistically significant reductions in mean monthly migraine days from baseline (average of approximately 16.1 days) over weeks 1 through 12 was met with a reduction of 8.2 monthly migraine days for 300mg ($p<0.0001$) and 7.7 days for 100mg ($p<0.0001$) compared to a reduction of 5.6 days for placebo. The key secondary endpoints and other endpoints met include:

- Migraine prevalence on Day 1 post-infusion: 52 percent reduction (300mg, $p<0.0001$) and 51 percent reduction (100mg, $p=0.0001$) from baseline in migraine risk on Day 1 post-infusion compared to 27 percent for placebo (p-values reflect Day 1 prevalence rate comparison between eptinezumab vs. placebo).
- 50% responder rates for weeks 1 through 12: 61 percent (300mg, $p<0.0001$) and 58 percent (100mg, $p<0.0001$) of patients achieved 50 percent or greater reduction in migraine days from baseline compared to 39 percent for placebo.
- 75% responder rates for weeks 1 through 4: 37 percent (300mg, $p<0.0001$) and 31 percent (100mg, $p<0.0001$) of patients achieved a 75 percent or greater reduction in migraine days from baseline, compared to 16 percent for placebo.
- 75% responder rates for weeks 1 through 12: 33 percent (300mg, $p<0.0001$) and 27 percent (100mg, $p=0.0001$) of patients achieved a 75 percent or greater reduction in migraine days from baseline, compared to 15 percent for placebo.
- 100% responder rates for weeks 1 through 12 (post hoc analysis): an average 15 percent (300mg, $p<0.0001$, unadjusted) and 11 percent (100mg, $p<0.0001$, unadjusted) of the patient population had no migraines for months 1 to 3, compared to 5 percent for placebo.

All other pre-specified key secondary endpoints were met with very high statistical significance.

The observed safety profile in PROMISE 2, to date, is consistent with previously reported eptinezumab studies. Adverse event rates among eptinezumab-treated subjects were similar to placebo-treated subjects. The most

commonly reported adverse events for eptinezumab, occurring at an incidence of 2.0% or greater, were nasopharyngitis (6.3 percent), upper respiratory infection (4.0 percent), nausea (3.4 percent) and urinary tract infection (3.1 percent), arthralgia (2.3 percent), dizziness (2.6 percent), anxiety (2.0 percent) and fatigue (2.0 percent). Full safety data will be available at the completion of the trial.

Additional results from the trial are expected to be presented at future medical meetings.

PROMISE 1 Top-Line Data (Frequent Episodic Migraine): This Phase 3 double-blind, placebo-controlled, randomized global trial evaluating the safety and efficacy of eptinezumab for episodic migraine prevention. In the study, 888 patients were randomized to receive eptinezumab (300mg, 100mg or 30mg), or placebo administered by infusion once every 12 weeks for a full year. To be eligible for the trial, patients must have experienced at ≤14 headache days per month, of which at least four met the criteria for migraine. The primary endpoint was the mean change from baseline in monthly migraine days over the 12-week, double-blind treatment period. Key secondary study endpoints assessed through 12 weeks included reduction from baseline (the daily mean

migraine prevalence over the 28-day screening period) in migraine prevalence on Day 1 and reduction of at least 50% and 75% from baseline in mean monthly migraine days.

On June 27, 2017, we announced that eptinezumab met primary and key secondary endpoints with very high statistical significance vs. placebo. The primary endpoint, demonstrating statistically significant reductions in monthly migraine days from baseline (average of 8.6 days) over weeks 1 through 12 was met with a reduction of 4.3 monthly migraine days for 300mg (p=0.0001) and 3.9 days for 100mg (p=0.0179) compared to an average 3.2 days for placebo. A 30mg dose level evaluated in the study was not tested as per the statistical analysis plan. The key secondary endpoints and other endpoints met included:

- Secondary endpoints evaluated over the first 12 weeks following the first quarterly dose include:
- Migraine prevalence Day 1 post-infusion: 53.6 percent reduction (300mg, p=0.0087, unadjusted), and 51.3 percent (100mg, p=0.0167, unadjusted) in migraine risk from baseline on Day 1 post-infusion compared to 20.7 percent for placebo.
- 50% responder rates for weeks 1 through 12: 56.3 percent (300mg, p=0.0001) and 49.8 percent (100mg, p=0.0085, unadjusted) of patients achieved 50 percent or greater reduction in migraine days from baseline compared to 37.4 percent for placebo.
- 75% responder rates for weeks 1 through 4: 31.5 percent (300mg, p=0.0066) and 30.8 percent (100mg, p=0.0112) of patients achieved 75 percent or greater reduction in migraine days from baseline compared to 20.3 percent for placebo.
- 75% responder rates for weeks 1 through 12: 29.7 percent (300mg, p=0.0007) and 22.2 percent (100mg, not statistically significant) of patients achieved 75 percent or greater reduction in migraine days from baseline compared to 26.2 percent for placebo.
- Secondary endpoints demonstrated an increase in efficacy following a second quarterly dose of eptinezumab:
- 75% responder rates for weeks 13 through 24: 40.1 percent (300mg, p=0.0006) and 33.5 percent (100mg, p=0.0434, unadjusted) of patients achieved 75 percent or greater reduction in migraine days from baseline compared to 24.8 percent for placebo.
- 100% responder rates for weeks 1 through 24 (post hoc analysis): an average of 20.6 percent (300mg) and 15.6 percent (100mg) of the patient population had no migraines for months 1 through 6, compared to 11.7 percent for placebo.

Full 24-week data from PROMISE 1 was presented at the 18th Congress of the International Headache Society in September 2017. We expect to report data from the third and fourth doses in PROMISE 1 during the first half of 2018.

The observed safety profile in PROMISE 1, to date, is consistent with previously reported eptinezumab studies. Adverse event rates among eptinezumab-treated subjects were similar to placebo-treated subjects. The most commonly reported adverse events for eptinezumab, occurring at an incidence of 2.0% or greater, were upper respiratory tract infection (10.5 percent), nasopharyngitis (7.2 percent), sinusitis (6.3 percent), dizziness (4.5 percent), cough (3.6 percent), fatigue (3.6 percent), influenza (3.6 percent), nausea (3.6 percent), arthralgia (3.2 percent), bronchitis (3.2 percent), diarrhea (2.7 percent), sinus congestion (2.3 percent), gastroenteritis viral (2.2 percent) and oropharyngeal pain (2.2 percent). Full safety data will be available at the completion of the trial.

Completed Phase 2b Clinical Trial (Chronic Migraine). This Phase 2b clinical trial was a double-blind, placebo-controlled, randomized, single intravenous infusion, dose ranging study in 588 patients with chronic migraine. Patients were randomized to receive a single intravenous infusion of 10mg, 30mg, 100mg or 300mg of eptinezumab or placebo (approximately 120 patients per group). The primary efficacy endpoint of the study was the change in migraine days between eptinezumab and placebo as determined by the 75% responder rates over a 12-week

period. Endpoints were also evaluated at week 24 and at week 48 (study end). In March 2016, we announced the following positive top-line data from the trial:

- The 300mg and 100mg dose levels of eptinezumab met the primary efficacy endpoint of the study, a 75% reduction in migraine days over the entire 12 weeks in 33% and 31% of patients, respectively ($p < 0.05$) compared to 21% for placebo.
- A single administration of eptinezumab resulted in an immediate and persistent mean reduction in migraine days from baseline throughout the 12 weeks at the 300mg ($p < 0.01$), 100mg ($p < 0.01$), and 30mg ($p < 0.01$) dose levels compared to placebo, meeting the secondary efficacy endpoint.

- A single administration of eptinezumab at 300mg, 100mg or 30mg dose levels demonstrated a persistent reduction in migraine days for the entire 12 weeks, supporting a quarterly dosing strategy.
- The 10mg dose of eptinezumab was identified as sub-therapeutic.
- The safety profile was consistent with that observed in earlier eptinezumab clinical trials.

In July 2016, we announced that top-line 24-week data from this trial demonstrated persistent migraine prevention in patients with chronic migraine, confirming and extending the 12-week data announced in March 2016. The 75% responder rate for the entire 24 weeks at the 300mg, 100mg and 30mg dose levels was 31%, 29% and 30%, respectively, compared to a placebo rate of 20%. Eptinezumab also demonstrated a persistent mean reduction in migraine days from baseline throughout the 24-week period. The statistical analysis plan for the Phase 2b trial did not provide for analyses of statistical significance at time points after the primary endpoint at 12 weeks.

A post-hoc analysis of the data demonstrated that within 48 hours after eptinezumab administration there was more than a 50% reduction in the percentage of patients experiencing a migraine after receiving eptinezumab versus baseline, compared to a 17% reduction in patients administered placebo. An analysis of the data also demonstrated that this rapid reduction in migraine days and significant separation between those patients receiving eptinezumab versus placebo was maintained at four weeks after administration.

Completed Phase 2 Proof-of-Concept Clinical Trial (Frequent Episodic Migraine). Our first completed Phase 2 clinical trial of eptinezumab was a single 1000mg intravenous infusion dose, double-blind, placebo-controlled, randomized proof-of-concept trial to evaluate the safety, pharmacokinetics and efficacy of eptinezumab in patients with frequent episodic migraine. Pharmacokinetics measures the amount of a specific drug in the body over a period of time, and includes the process of absorption, distribution, metabolism and excretion of the drug. Approximately 80 patients each received one dose of eptinezumab in the clinical trial.

Differences in the change in mean migraine days per month was the approvable endpoint for the pivotal clinical trials of Botox, which has been approved for prevention of chronic migraine. The primary endpoint for our proof-of-concept trial was the difference between eptinezumab and placebo in the change of mean migraine days per month from baseline to weeks five through eight following one dose of eptinezumab. As illustrated in the figure below, in the trial, one dose of eptinezumab produced a rapid and persistent reduction in migraine days that was statistically significant when compared to placebo, in terms of both change in migraine days per month ($p=0.03$) and the magnitude of the change in migraine days prevented across all patients ($p<0.001$) at the primary endpoint of eight weeks. The reduction in migraine days per month was also statistically significant across the entire combined three-month trial period ($p=0.0078$).

In addition to reduction of mean migraine days per month as an efficacy endpoint, a responder analysis was performed with 16% of patients receiving a single dose of eptinezumab achieving a complete 100% response (zero migraine days) versus 0% on placebo over the entire 12-week period following infusion. In any four-week period of the trial (weeks 1-4, 5-8 or 9-12), approximately 75% of patients achieved a >50% reduction, 45% or more achieved a >75% reduction and 27% or more achieved a 100% reduction in migraine days. Eptinezumab provided a statistically significant reduction in migraines days versus placebo over the entire three-month period of the trial ($p<0.001$).

Eptinezumab was well-tolerated and adverse events were comparable in terms of type and frequency across eptinezumab and placebo groups. In addition, there were no meaningful differences between the eptinezumab treatment and placebo groups with respect to adverse events, cardiovascular measures or laboratory safety data.

Patients in this trial were followed for an additional three months for a total of six months (24 weeks) follow-up. The percentage of patients achieving a >50, >75 or 100% response for the entire 24-week duration of follow-up was similar to that observed for the first 12 weeks, suggesting that the response to a single dose of eptinezumab was

persistent and long lasting.

Phase 1 Clinical Trials. We have completed various Phase 1 clinical trials of eptinezumab, including a Phase 1 clinical trial demonstrating that the pharmacokinetics and pharmacodynamics by infusion, subcutaneous or intramuscular injection of eptinezumab support a quarterly single injection dosing strategy.

Safety Profile. Various serious adverse events, or SAEs, have been observed across all clinical trials to date for eptinezumab. However, the relevant clinical investigators concluded that all observed SAEs to date were found to be unrelated to eptinezumab. We have observed some injection-site reactions, or ISRs, in Phase 1 clinical trials of subcutaneous and intramuscular injections of eptinezumab. Additional studies or requirements from the FDA for future studies may be necessary to address these ISRs.

ALD1910

ALD1910 is a genetically engineered monoclonal antibody discovered and designed by Alder to specifically inhibit pituitary adenylate cyclase-activating peptide-38, or PACAP-38, a protein active in mediating the initiation of migraine. We believe ALD1910 holds potential as a migraine prevention treatment for those who have an inadequate response to therapeutics directed at CGRP, and could provide an important new therapeutic option to migraine patients and their physicians.

ALD1910 is currently undergoing IND enabling preclinical studies. Similar to our other internally developed product candidates, ALD1910 is designed to have favorable antibody properties and a desirable product profile we consider critical to a streamlined development path.

Clazakizumab

Clazakizumab is a novel monoclonal antibody that inhibits the pro-inflammatory cytokine interleukin-6 (IL-6), an important driver of the inflammatory response. IL-6 is also implicated in the transition from acute to chronic inflammation. Chronic inflammation is a notable feature of several diseases, including rheumatoid arthritis (RA) and psoriatic arthritis. Clazakizumab completed two positive Phase 2b clinical studies establishing proof-of-concept for RA.

In May 2016, Alder licensed the exclusive worldwide rights to clazakizumab to Vitaeris. In exchange for the rights to clazakizumab, we received an equity interest in Vitaeris and are eligible to receive royalties and certain other payments. In November 2017, Vitaeris and its shareholders, including Alder, entered into a strategic collaboration and purchase option agreement with a third party, CSL Limited, to expedite the development of clazakizumab as a therapeutic option for solid organ transplant rejection.

Preclinical Pipeline

We are actively working to expand our antibody therapeutic pipeline in opportunities where our technology provides favorable development advantage in areas of unmet medical need, seeking both first-in-class and best-in-class therapeutics. We prioritize targets that meet the criteria of either genetic validation or clinical demonstration that they play a central role in the disease state. We are continuing to evaluate additional potential candidates that represent diverse opportunities in indications that may be eligible for orphan designations and/or indications where monoclonal antibodies have not previously played a role in the treatment paradigm, such as was the case with our eptinezumab program for migraine prevention.

Technology Platform

We built and use a proprietary antibody platform to discover and develop monoclonal antibody therapeutics that enables us to engineer our candidates to have properties that we believe optimize the therapeutic potential for patients. Since the unique structure, including sequence, of an antibody determines how it functions and behaves, we specifically engineer our candidates to have properties aligned with the desired therapeutic profile. Leveraging this proprietary platform, we select for properties that we consider important in order to optimize safety, tolerability and efficacy. We further select for properties that support reduced dosing volumes and frequency, time to onset of therapeutic effect, route of administration flexibility, reduced immunogenicity compared to other monoclonal antibody therapeutics, and other benefits. The specific monoclonal antibody properties that we consider important to optimize in the selection and development of our candidates to support best-in-class target therapeutic profiles include:

- Bioavailability
- Binding affinity and specificity
- Half-life
- Immunogenicity
- Manufacturing efficiency
- Formulation properties

Our proprietary platform consists of three components that we believe together allows us to optimize the discovery and selection of monoclonal antibody product candidates with the specific, pre-defined, properties that confer best-in-class therapeutic potential for patients:

- Antibody selection (ABS): our proprietary antibody selection platform that provides access to diverse antibody collections that meet our therapeutic target profile and provides access to optimal properties of high affinity and selectivity.
- A pioneering process we developed that humanizes rabbit antibodies to produce therapeutic antibodies that are greater than 95% human. Unlike fully-human antibodies, our antibodies are designed to lack certain sugars in an effort to minimize the body's recognition of such antibodies as foreign, thereby limiting infusion reactions as well as maximizing durability of the therapeutic response.
- Our yeast-based proprietary manufacturing technology, MabXpress.

We also believe these technologies allow us to address a number of critical development priorities early, thereby reducing our development cost and timeline.

Antibody Discovery and Candidate Selection Technology

Antibodies are produced by the immune system in humans and other warm-blooded animals. They are naturally generated to help defend and protect from disease and infections. Antibodies are produced and secreted by specialized antibody producing cells called B cells. Traditionally, rodents have been used as the source of therapeutic antibodies. To find these antibodies, we remove the B cells from the spleen and fuse to a cancer cell. The combined cancer and B cell, or "hybridoma," is able to live longer from this host than normal B cells would alone. Generally, this process has trouble recovering an antibody with the desired properties due to its low overall efficiency. Collectively, this limits the ability to identify high-quality antibody therapeutics with optimal therapeutic properties.

We discover all of our product candidates in-house with our ABS technology. As a precursor to discovery, we choose to target freely-circulating proteins, such as ligands, which are critical to the disease biology and are part of well understood disease pathways. We believe this strategy can lead to fewer drug doses at lower concentrations, while potentially minimizing off target activity and associated side-effects. The clinical relevance of these proteins is highly validated by prior scientific or clinical research.

Our ABS technology has been successfully applied to a wide cross section of therapeutic targets that range from small biologically active peptides to more traditional monoclonal antibody targets. ABS allows us to rapidly evaluate all the B cells in a host and identify the key subset of cells that produce the antibody responsible for the desired therapeutic effect. We believe one of our competitive advantages is our proprietary method to keep these B cells alive while we exhaustively screen them. This is an iterative process that allows us to identify the rare antibodies that possess the ideal qualities needed to be a successful therapeutic, for example manufacturability, therapeutic stability, durability and favorable safety.

Our ABS technology has been applied in all our preclinical and clinical programs and led to the selection of our most advanced product candidate, eptinezumab, as well as ALD1910 and clazakizumab. We also use our ABS technology to provide bio-analytical support for all our product candidates in the clinic.

Antibody Humanization and Therapeutic Design

Antibodies derived from non-human sources elicit a natural rejection response, and if left unchanged when injected into humans, are removed rapidly and quickly lose their therapeutic effect. Common sources of antibodies include mice and rats, which have antibodies that are structurally different from humans and need to be altered to be more human-like.

Historically, this is a complex and difficult undertaking to convert rodent antibodies into human therapeutics that retain all the original rodent antibody properties. This is a highly iterative process that is both time and labor intensive and is fraught with significant failure.

We have pioneered the use of rabbit antibodies as the starting materials for our product candidates. Compared to rodent antibody humanization, our rabbit antibody humanization results in more human-like antibodies that maintain their original properties and are faster to produce. As a result, our process requires fewer iterations to complete humanization. Using our proprietary technology, we consistently generate antibody therapeutics that are greater than 95% human in terms of their sequence content. However, unlike fully-human antibodies, we specifically design our antibodies to lack certain sugars in order to further minimize the body's recognition of such antibodies as foreign, thereby limiting infusion reactions, as well as maximizing durability of the therapeutic response. Our technology

results in product candidates that are well-tolerated by patients.

Our product candidates are also differentiated from most other monoclonal antibodies based on our use of an immunoglobulin G1 (IgG1) backbone. While all therapeutic antibodies use an immunoglobulin backbone, there are four different IgG subclasses. We believe that the use of IgG1, in combination with our decision to engineer our antibodies to remove certain sugars from the backbone, improves certain therapeutic characteristics, including reduced immunogenicity and improved half-life.

Intellectual Property

Our success will significantly depend upon our ability to obtain and maintain patent and other intellectual property and proprietary protection for our product candidates and antibody platform. For the specific antibody product candidates in all of our programs, we seek to protect the candidate antibody and variants thereof, compositions containing the antibody, methods of manufacturing the antibody, and the use of the antibody in treating human disease conditions where we or any future partner is actively pursuing, or contemplate pursuing regulatory approval permitting the marketing of the antibody for use as a human therapeutic agent. In addition to pursuing patent protection for our key technologies, we rely upon unpatented trade secrets, know-how and continuing technological innovation to develop and maintain our competitive position.

We seek to protect our proprietary information, in part, by using confidentiality agreements with our collaborators, employees and consultants and invention assignment agreements with our employees and selected consultants. Despite these measures, any of our intellectual property and proprietary rights could be challenged, invalidated, circumvented, infringed or misappropriated, or such

intellectual property and proprietary rights may not be sufficient to permit us to take advantage of current market trends or otherwise to protect competitive advantages. For more information, see the section of this Annual Report on Form 10-K titled “Risk Factors—Risks Related to Intellectual Property.”

Eptinezumab

Our patent applications relating to compositions and uses for eptinezumab have been broadly filed worldwide. If these applications issue as patents, they are estimated to expire in 2032.

We own, or co-own with exclusive rights, four patent families related to eptinezumab. Each family contains pending U.S. and foreign counterpart applications with claims directed to compositions and/or methods of using eptinezumab and variants thereof, alone or in combination to treat or prevent various human diseases and conditions associated with elevated CGRP such as migraine. Patents based on the earliest filed applications, if granted, are expected to expire in 2032.

We have full ownership of the first eptinezumab patent family, which relates to eptinezumab compositions and methods for treating or preventing various human disease conditions associated with elevated CGRP such as migraine. We hold one U.S. patent with granted claims directed to eptinezumab and compositions containing eptinezumab.

We are the co-owner and exclusive licensee of the second eptinezumab patent family, which relates to use of eptinezumab compositions in methods for treating or preventing various human disease conditions associated with photophobia or light aversion. We hold one U.S. patent with granted claims directed to use of eptinezumab to inhibit photophobia or light aversion.

We are the co-owner and exclusive licensee of the third eptinezumab patent family, which relates to use of eptinezumab compositions in methods for treating or preventing various other human disease conditions associated with diarrhea. We hold one U.S. patent with granted claims directed to use of anti-CGRP antibodies, including eptinezumab, or anti-CGRP receptor antibodies to inhibit or treat diarrhea.

A fourth patent family, which is owned by us exclusively and estimated to expire in 2034, relates to the use of eptinezumab for regulating glucose metabolism.

ALD1910

We have patent applications for six patent families related to ALD1910 covering ALD1910 compositions and uses for anti-PACAP antibodies. If these applications issue as patents, they are estimated to expire in 2036.

Clazakizumab

Our patents and patent applications relating to clazakizumab, which all are exclusively licensed to Vitaeris, have been broadly filed worldwide. Many of these applications have issued in the United States and other countries and will expire between 2028 and 2031, without any patent term extensions.

We hold four U.S. patents with granted claims directed to the clazakizumab antibody and compositions containing the clazakizumab antibody. These patents will expire in 2028.

We hold four U.S. patents with granted claims directed to nucleic acids encoding clazakizumab and methods of use thereof to produce this antibody. These patents will expire in 2028.

We hold 27 U.S. patents with granted claims broadly or specifically directed to the use of clazakizumab and variants thereof, alone or in combination, to treat or prevent human disease conditions associated with elevated IL-6. These patents will expire between 2028 and 2031.

Technologies

We hold four U.S. patents and numerous foreign patents related to MabXpress, our yeast-based proprietary manufacturing technology. Our MabXpress patents and patent applications relate to the expression of heteropolymeric polypeptides, such as antibodies, in Pichia. These patents will expire between 2024 and 2026.

We have sought patent protection for our antibody discovery method, of which nine foreign patents have been granted, and one pending U.S. application and two foreign applications are under examination. These foreign patents will expire in 2027. A patent based on the U.S. application, if issued, is expected to expire in 2027.

We also have sought patent protection for our proprietary method of humanizing rabbit antibodies. Eight of these patents have been granted in foreign territories and one U.S. and seven pending foreign patent applications are under examination. These foreign patents will expire in 2028. Patents based on the U.S. applications, if issued, are expected to expire in 2028. Patents based on the foreign applications, if issued, are expected to expire in 2028.

We also hold three granted U.S. patents claiming a yeast promoter sequence and its use in the MabXpress technology. These patents will expire in 2027.

Early Stage Programs

All programs where there is a potential at a later stage to transition into clinical candidate nomination are covered by pending U.S. (non-provisional or provisional), international (PCT) or directly filed foreign patent applications. There are currently eight U.S. patent applications and 19 granted U.S. patent that support these programs, and in some instances corresponding PCT and/or foreign counterpart applications have been filed.

Technology Licenses

Teva Pharmaceutical Industries Ltd.

In January 2018, we entered into a European patent settlement and global license agreement with Teva Pharmaceuticals International GmbH, or Teva GmbH. The agreement resolved our appeal following opposition proceedings before the European Patent Office, or EPO, related to Teva GmbH's European Patent No. 1957106 B1, with respect to CGRP antagonist antibodies, and provided clarity regarding our freedom to develop, manufacture and commercialize eptinezumab. Under the terms of the agreement, we received a non-exclusive license to Teva GmbH's CGRP patent portfolio, which includes the opposed European patent, to develop, manufacture and commercialize eptinezumab in the United States and worldwide, excluding Japan and Korea. While the agreement does not provide us with a license for Japan and Korea, we believe we have freedom to develop, manufacture and commercialize eptinezumab in these countries. In exchange for the license, we agreed to withdraw our appeal before the EPO; make an immediate one-time payment of $25 million to Teva GmbH, which we made in January 2018; make a second one-time payment of $25 million upon the approval of a BLA for eptinezumab with the FDA or of an earlier equivalent filing with a regulatory authority elsewhere in the license territory in which any Teva GmbH licensed patents exist; and pay $75 million at each of two sales-related milestones (at $1 billion and $2 billion in annual sales) and provide certain royalty payments on net sales at rates from 5% to 7% following the commercial launch of eptinezumab.

Keck Graduate Institute of Applied Life Sciences

In October 2004, we entered into a royalty-free license agreement with Keck Graduate Institute of Applied Life Sciences, or Keck, under which we obtained an exclusive, worldwide license to Keck's patent rights in certain inventions, or the Keck patent rights, and technology or the Keck technology, related to production and optimization of antibodies in yeast, including certain patents relating to our ABS and MabXpress technologies. Under the license agreement, we are permitted to research, develop, manufacture and commercialize products using the Keck patent rights for all research and commercial uses, and to sublicense such rights. Keck retained the right, on behalf of itself and other non-profit institutions, to use the Keck patent rights and Keck technology for educational and research purposes and to publish information about the Keck patent rights and to further use the Keck technology for purposes other than production and optimization of antibodies in yeast.

In consideration for the rights granted to us under the license agreement, we issued Keck an aggregate of 40,000 shares of our common stock. As additional consideration, we are required to pay an annual license maintenance fee during the term of the agreement.

The license agreement requires that we use commercially reasonable efforts to develop and commercialize one or more products that are covered by the Keck patent rights. We may terminate the license agreement upon 30 days' notice to Keck. Either party may terminate the license agreement in the event of material breach of the license

agreement which remains uncured after 90 days of receiving written notice of such breach. Absent early termination, the license agreement will automatically terminate on a country-by-country basis upon the expiration date of the longest-lived patent right included in the Keck patent rights.

Other

We also license intellectual property from certain other parties that we believe to be useful for the conduct of our business and may enter into additional license agreements in the future.

Information about Segments and Geographic Revenue

Information about segments and geographic revenue is set forth in the notes to consolidated financial statements included elsewhere in this report.

Manufacturing

We have adopted a manufacturing strategy of contracting with a variety of contract manufacturing organizations, or CMOs, within North America and Europe for the manufacture of eptinezumab, ALD1910, and future product candidates. This has enabled us

to produce products under current Good Manufacturing Practices, or cGMP, controls for our completed and planned clinical trials. A protocol of methods has been established at these manufacturers along with specific testing facilities to generate sufficient information to inform the appropriate regulatory authorities. We historically relied on a single smaller scale CMO to manufacture and provide us with clinical supplies of eptinezumab. We have entered into agreements with other CMOs to manufacture eptinezumab drug substance and drug product at larger scale as we prepare for commercialization. We are conducting a pharmacokinetic comparability study of our initial commercial supply of eptinezumab for our BLA submission planned for the second half of 2018. We expect to use eptinezumab manufactured by our commercial suppliers in future clinical studies. We anticipate there will be continued interaction with additional CMOs as we advance other product candidates.

Competition

The development and commercialization of new therapeutic products is highly competitive. Our success will be based in part on our ability to identify, develop and manage products that are safer, more efficacious and/or more cost-effective than alternative therapies. We face competition with respect to our current product candidates, and will face competition with respect to product candidates that we may seek to develop or commercialize in the future, from major pharmaceutical companies, specialty pharmaceutical companies and biotechnology companies worldwide. In addition, our ability to compete may be affected in many cases by insurers or other third-party payors seeking to encourage the use of biosimilar products, which are expected to become available over the coming years. Many of our competitors are large pharmaceutical companies that will have a greater ability to reduce prices for their competing drugs in an effort to gain market share and undermine the value proposition that we might otherwise be able to offer to payors.

Potential competitors also include academic institutions, government agencies and other public and private research organizations that conduct research, seek patent protection and establish collaborative arrangements for research, development, manufacturing and commercialization. Many of these competitors are attempting to develop therapeutics for our target indications.

Eptinezumab, if approved, will compete with beta blockers that are approved for prevention of episodic and chronic migraine such as propranolol, marketed by Wyeth, and other treatments such as topiramate, marketed by Johnson & Johnson, and sodium valproate, marketed by Divalproex. In addition, Botox, marketed by Allergan, is approved for the prevention of chronic migraine and commonly prescribed for disabling episodic migraine. We are also aware of several CGRP inhibiting therapies currently in development that could compete with eptinezumab, including Amgen’s erenumab, Lilly’s galcanezumab and Teva’s fremanezumab, all of which are therapies using antibodies similar to eptinezumab. Amgen, Eli Lilly and Teva have each submitted BLAs for their competing CGRP therapies, which, if approved, would enable them to commercialize their CGRP therapies before we are able to do so with eptinezumab. Furthermore, even if the class of CGRP inhibiting therapies receive regulatory approval and are determined to be more effective in treating high-frequency and chronic migraine, patients may be satisfied using cheaper generic abortive medications such as triptans, which could limit eptinezumab market penetration in the migraine prevention marketplace.

The commercial opportunity for eptinezumab or our other product candidates could be reduced or eliminated if our competitors develop and commercialize products that are safer, more effective, more convenient or less expensive than our product candidates or any other product candidate that we may develop. Our competitors also may obtain FDA or other regulatory approval for their products more rapidly than we may obtain approval for ours. In addition, our ability to compete may be affected because in many cases insurers or other third-party payers seek to encourage the use of generic products.

We believe that eptinezumab has potential benefits over competitive products as described under "—Our Pipeline." As a result, we believe that eptinezumab should be well placed to capture market share from competing products if approved. However, even with those benefits, eptinezumab may be unable to compete successfully against these products. See "Risk Factors — Risks Related to eptinezumab and Our Other Product Candidates."

Government Regulation

The FDA and comparable regulatory agencies in state and local jurisdictions and in foreign countries impose substantial requirements upon the clinical development, manufacture and marketing of biopharmaceutical products. These agencies and other federal, state and local entities regulate research and development activities and the testing, manufacture, quality control, import, export, safety, effectiveness, labeling, storage, distribution record keeping, approval, advertising and promotion of our products.

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

- submission of an IND which must become effective before clinical trials may begin;
- adequate and well-controlled human clinical trials to establish the safety, purity and potency of the proposed biologic product candidate for its intended purpose;
- pre-approval inspection of manufacturing facilities for their compliance with cGMP and selected clinical investigations for their compliance with Good Clinical Practices, or GCP; and

- FDA approval of a BLA to permit commercial marketing for particular indications for use.

The testing and approval process requires substantial time, effort and financial resources. Prior to commencing the first clinical trial with a product candidate, we must submit an IND to the FDA. The IND automatically becomes effective 30 days after receipt by the FDA, unless the FDA, within the 30-day time period, raises safety concerns or questions about the conduct of the clinical trial by imposing a clinical hold. In such a case, the IND sponsor and the FDA must resolve any outstanding concerns before the clinical trial can begin. Submission of an IND may not result in FDA authorization to commence a clinical trial. A separate submission to the existing IND must be made for each successive clinical trial conducted during product development. Furthermore, an independent institutional review board for each medical center proposing to conduct the clinical trial must review and approve the plan for any clinical trial and its informed consent form before the clinical trial commences at that center. Regulatory authorities or an institutional review board or the sponsor may suspend a clinical trial at any time on various grounds, including a finding that the subjects or patients are being exposed to an unacceptable health risk. Some studies also include a data safety monitoring board, which receives special access to unblinded data during the clinical trial and may recommend that the sponsor halt the clinical trial if it determines that there is an unacceptable safety risk for subjects or other grounds, such as no demonstration of efficacy.

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

- Phase 1—Studies are initially conducted to test the product candidate for safety, dosage tolerance, absorption, metabolism and distribution.
- Phase 2—Studies are conducted with groups of patients with a specified disease or condition to provide enough data to evaluate the preliminary efficacy, optimal dosages and dosing schedule and expanded evidence of safety. Multiple Phase 2 clinical trials may be conducted to obtain information prior to beginning larger and more expensive Phase 3 clinical trials.
- Phase 3—Clinical trials are undertaken in large patient populations to further evaluate dosage, to provide statistically significant evidence of clinical efficacy and to further test for safety in an expanded patient population at multiple clinical trial sites. These clinical trials are intended to establish the overall risk/benefit ratio of the product and provide an adequate basis for product approval.
- Phase 4—The FDA may require, or companies may pursue, additional clinical trials after a product is approved. These so-called Phase 4 studies may be made a condition to be satisfied after approval. The results of Phase 4 studies can confirm the effectiveness of a product candidate and can provide important safety information.

Concurrent with clinical trials, companies usually complete additional animal studies and must also develop additional information about the biological characteristics of the product candidate 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 candidate and, among other things, 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 the product candidate does not undergo unacceptable deterioration over its shelf life.

BLA Submission and Review by the FDA

The results of product development, nonclinical studies and clinical trials are submitted to the FDA as part of BLA. The submission of BLA requires payment of a substantial User Fee to the FDA. The FDA may convene an advisory committee to provide clinical insight on application review questions. The FDA reviews applications to determine, among other things, whether a product is safe and effective for its intended use and whether the manufacturing controls are adequate to assure and preserve the product’s identity, strength, quality and purity. Before approving a BLA, the FDA will inspect the facility or facilities where the product is manufactured. The FDA will not approve an application unless it determines that the manufacturing processes and facilities are in compliance with cGMP

requirements and adequate to assure consistent production of the product within required specifications. Once the BLA submission has been accepted for filing, the FDA typically takes one year from submission to review the application and respond to the applicant, which can take the form of either a Complete Response Letter or Approval. The review process is often significantly extended by FDA requests for additional information or clarification. The FDA may delay or refuse approval of a BLA if applicable regulatory criteria are not satisfied, require additional testing or information and/or require post-marketing testing and surveillance to monitor safety or efficacy of a product. FDA approval of any BLA submitted by us will be at a time the FDA chooses. Also, if regulatory approval of a product is granted, such approval may entail limitations on the indicated uses for which such product may be marketed. Once approved, the FDA may withdraw the product approval if compliance with pre- and post-marketing regulatory standards is not maintained or if problems occur after the product reaches the marketplace. In addition, the FDA may require Phase 4 post-marketing studies to monitor the effect of approved products, and may limit further marketing of the product based on the results of these post-marketing studies.

Post-Approval Requirements

Any products manufactured or distributed by us pursuant to FDA approvals are subject to continuing regulation by the FDA, including record-keeping requirements and reporting of adverse experiences. Biologic manufacturers and their subcontractors are required to register their establishments with the FDA and certain state agencies, and are subject to periodic unannounced inspections

by the FDA and certain state agencies for compliance with cGMP, which impose certain procedural and documentation requirements upon us and our third-party manufacturers. We cannot be certain that we or our present or future suppliers will be able to comply with the cGMP regulations and other FDA regulatory requirements. If our present or future suppliers are not able to comply with these requirements, the FDA may halt our clinical trials, require us to recall a product from distribution, or withdraw approval of the BLA.

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

Healthcare Regulation

Our sales, promotion, medical education and other activities following product approval, and certain activities prior to approval, are and will be subject to regulation by numerous regulatory and law enforcement authorities in the United States in addition to FDA, including potentially the Federal Trade Commission, the U.S. Department of Justice, the Centers for Medicare & Medicaid Services (CMS), other divisions of the U.S. Department of Health and Human Services and state and local governments. Our current and future business activities, including our future promotional and scientific/educational programs, may be subject to additional healthcare regulation and enforcement by the federal government and by authorities in the states and foreign jurisdictions in which we conduct our business. Such laws include, without limitation, state and federal anti-kickback, false claims, patient data privacy and security, and physician sunshine laws and regulations, many of which may become more applicable if our product candidates are approved and we begin commercialization.

Depending on the circumstances, failure to meet these applicable regulatory requirements can result in criminal prosecution, fines or other penalties, contractual damages, reputational harm, disgorgement, exclusion from participation in government healthcare programs, individual imprisonment, integrity obligations, the curtailment of our operations, diminished profits or future earnings, injunctions, recall or seizure of products, total or partial suspension of production, denial or withdrawal of pre-marketing product approvals, private "qui tam" actions brought by individual whistleblowers in the name of the government or refusal to allow us to enter into supply contracts, including government contracts.

Coverage and Reimbursement

Sales of pharmaceutical products, when and if approved for marketing, depend significantly on the availability of third-party coverage and adequate reimbursement. Third-party payors include government health administrative authorities, managed care providers, private health insurers and other organizations. These third-party payors are increasingly challenging the price and examining the cost-effectiveness of medical products and services, and significant uncertainty exists as to the coverage and reimbursement status of any product candidates for which we obtain regulatory approval. A payor's decision to provide coverage for a drug product does not imply that an adequate reimbursement rate will be approved. Further, one payor's determination to provide coverage for a drug product does not assure that other payors will also provide coverage for the drug product. Adequate third-party reimbursement may not be available to enable us to maintain price levels sufficient to realize an appropriate return on our investment in product development.

In addition, significant uncertainty exists as to the coverage and reimbursement status of newly approved healthcare products. We may need to conduct expensive clinical studies to demonstrate the comparative cost-effectiveness of our products. The product candidates that we develop may not be considered cost-effective. It is time consuming and expensive for us to seek reimbursement from third-party payors. Decreases in third-party reimbursement for our product candidates or a decision by a third-party payor not to cover our product candidates could reduce physician usage of our products once approved and have a material adverse effect on our sales, results of operations and financial condition. Coverage and adequate reimbursement may not be available or sufficient to allow us to sell our products on a competitive and profitable basis. 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.

Health Reform

The United States and some foreign jurisdictions are considering or have enacted a number of legislative and regulatory proposals to change the healthcare system in ways that could affect our ability to sell our products profitably. Among policy makers and payers in the United States and elsewhere, there is significant interest in promoting changes in healthcare systems with the stated goals of containing healthcare costs, improving quality and/or expanding access. In the United States, the pharmaceutical industry has been a particular focus of these efforts and has been significantly affected by major legislative initiatives, such as the Patient Protection and Affordable Care Act, as amended by the Health Care and Education Reconciliation Act, or collectively the ACA. Among the provisions of the ACA of importance to our business are: an annual fee on any entity that manufactures or imports

specified branded prescription drugs and biologic agents; an increase in the statutory minimum rebates a manufacturer must pay under the Medicaid Drug Rebate Program; extension of a manufacturer's Medicaid rebate liability; an expansion of eligibility criteria for Medicaid programs; and a new Medicare Part D coverage gap discount program. However, in January 2017, Congress voted to adopt a budget resolution for fiscal year 2017 that authorizes the implementation of legislation that would repeal portions of the ACA. Further, on January 20, 2017, President Trump 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 Congress, the U.S. House of Representatives passed ACA replacement legislation known as the American Health Care Act of 2017 in May 2017, which was not introduced in the Senate. More recently, the Senate Republicans have proposed multiple bills to repeal and replace portions of the ACA. Although none of these measures have been enacted, Congress may consider other legislation to repeal or replace certain elements of the ACA. On October 12, 2017, President Trump signed another Executive Order directing certain federal agencies to propose regulations or guidelines to permit small businesses to form association health plans, expand the availability of short-term, limited duration insurance, and expand the use of health reimbursement arrangements, which may circumvent some of the requirements for health insurance mandated by the ACA.

Other legislative changes have been proposed and adopted since the ACA was enacted. These changes included the Budget Control Act of 2011, which caused aggregate reductions to Medicare payments to providers of up to 2% per fiscal year effective April 1, 2013 which, following passage of the Bipartisan Budget Act of 2015, will stay in effect through 2025 unless additional Congressional action is taken. Additionally, the American Taxpayer Relief Act of 2012, among other things, further reduced Medicare payments to several types of providers.

There has also been increasing legislative and enforcement interest in the United States with respect to specialty drug pricing practices. Specifically, there have been several recent U.S. Congressional inquiries and proposed bills designed to, among other things, bring more transparency to drug pricing, review the relationship between pricing and manufacturer patient programs, and reform government program reimbursement methodologies for drugs. Adoption of price controls and cost containment measures, and adoption of more restrictive policies in jurisdictions with existing controls and measures, could further limit our net revenue and results.

Foreign Regulation

In addition to regulations in the United States, we will be subject to a variety of foreign regulations governing clinical trials and commercial sales and distribution of our products to the extent we choose to develop or sell any products outside of the United States. The approval process varies from country to country and the time may be longer or shorter than that required to obtain FDA approval. The requirements governing the conduct of clinical trials, product licensing, pricing and reimbursement vary greatly from country to country.

In the European Union, or EU, member states require both regulatory clearances by the national competent authority and a favorable ethics committee opinion prior to the commencement of a clinical trial. Under the EU regulatory systems, marketing authorization applications may be submitted under either a centralized or decentralized procedure. The centralized procedure provides for the grant of a single marketing authorization that is valid for all EU member states. It is compulsory for medicines produced by certain biotechnological processes. Because our products are produced in that way, we would be subject to the centralized process. Under the centralized procedure, pharmaceutical companies submit a single marketing authorization application to the EMA. Once granted by the European Commission, a centralized marketing authorization is valid in all EU member states, as well as the EEA countries Iceland, Liechtenstein and Norway. By law, a company can only start to market a medicine once it has received a marketing authorization.

Research and Development Expense

Since inception, we have devoted a significant amount of resources to develop our product candidates and our technologies. For the years ended December 31, 2017, 2016, and 2015, we recorded $252.9 million, $132.8 million, and $69.6 million, respectively, in research and development expenses.

Employees

As of December 31, 2017, we had 193 employees. Substantially all of our employees are in Bothell, Washington. None of our employees are represented by a labor union or covered under a collective bargaining agreement. We consider our employee relations to be good.

Corporate Information

We were incorporated in Delaware in May 2002 as Alder BioPharmaceuticals, Inc. Our headquarters are located at 11804 North Creek Parkway South, Bothell, WA 98011, and our telephone number is (425) 205-2900. Our website address is www.alderbio.com.

The information contained in, or that can be accessed through, our website is not part of, and is not incorporated into, this Annual Report on Form 10-K.

We file electronically with the Securities and Exchange Commission our Annual Reports on Form 10-K, Quarterly Reports on Form 10-Q, Current Reports on Form 8-K and amendments to those reports filed or furnished pursuant to Section 13(a) or 15(d) of the Securities Exchange Act of 1934, as amended. We make available on our website at www.alderbio.com, free of charge, through a hyperlink on our website, copies of these reports, as soon as reasonably practicable after electronically filing such reports with, or furnishing them to, the Securities and Exchange Commission. Further, a copy of this Annual Report on Form 10-K is located at the SEC's Public Reference Room at 100 F Street, N.E., Washington, D.C. 20549-2736. Information on the operation of the Public Reference Room can be obtained by calling the SEC at 1-800-SEC-0330. The SEC maintains a website that contains reports, proxy and information statements and other information regarding our filings at www.sec.gov.

Item 1A. Risk Factors

You should carefully consider the following risk factors, in addition to the other information contained in this report on Form 10-K, including the section of this report titled "Management's Discussion and Analysis of Financial Condition and Results of Operations" and our financial statements and related notes. If any of the events described in the following risk factors and the risks described elsewhere in this report occurs, or if any other risks of which we are not presently aware occurs, our business, operating results and financial condition could be seriously harmed. This report on Form 10-K also contains forward-looking statements that involve risks and uncertainties. Our actual results could differ materially from those anticipated in the forward-looking statements as a result of factors that are described below and elsewhere in this report.

Risks Related to Our Need for Additional Financing and Our Financial Results

We have incurred significant losses since our inception and anticipate that we will continue to incur significant losses for the foreseeable future.

We are a clinical-stage biopharmaceutical company. We do not currently have any products approved for sale, and we continue to incur significant research and development and general and administrative expenses. We have incurred significant operating losses in the past and expect to incur substantial and increasing losses for the foreseeable future. For the year ended December 31, 2017, our net loss was $288.9 million, and as of December 31, 2017, we had an accumulated deficit of $667.5 million.

To date, we have devoted substantially all of our efforts to research and development, including clinical trials, but have not completed development or commercialized any product candidates. We anticipate that our expenses will increase substantially as we:

- continue the research and development of eptinezumab, ALD1910 and our other product candidates;
- seek regulatory approvals for our product candidates that successfully complete clinical trials;
- establish a sales, marketing and distribution infrastructure and scale-up manufacturing capabilities to commercialize eptinezumab or any of our future product candidates if they receive regulatory approval; and
- enhance operational, financial and information management systems and hire additional personnel, including personnel to support development of our product candidates and, if a product candidate is approved, our commercialization efforts.

To be profitable in the future, we and any of our future collaborators must succeed in developing and eventually commercializing products with significant market potential. This will require success in a range of activities, including advancing product candidates, completing clinical trials of product candidates, obtaining regulatory approval for these product candidates and manufacturing, marketing and selling those products for which regulatory approval is obtained. We are only in the preliminary stages of some of these activities. We and any of our future collaborators

may not succeed in these activities and may never generate revenues that are sufficient to be profitable in the future.

Drug development is a highly speculative undertaking and involves a substantial degree of uncertainty. We have never generated any revenues from product sales and may never be profitable.

We have devoted substantially all of our financial resources and efforts to developing our technology platform, identifying product candidates and conducting preclinical studies and clinical trials for our product candidates. We have not completed the development of any products and eptinezumab is our only product candidate in the clinical stage of development. We have never generated revenues from the sale of any products.

Our ability to generate revenues and achieve profitability depends in large part on our ability, on our own or with any of our future collaborators, to successfully complete the development of, obtain the necessary regulatory approvals for, and commercialize our product candidates. We do not anticipate generating revenues from sales of products for several years, if at all. Our ability to generate future revenues from product sales depends on our and any of our future collaborators' success in:

- completing clinical development and obtaining regulatory approval for eptinezumab;
- entering into collaboration agreements with third parties with respect to eptinezumab, ALD1910 or our other product candidates for their development and commercialization in the United States or in international markets, and the continued financial and other support of these third parties under such collaboration agreements;

- launching and commercializing eptinezumab, if approved, and successfully establishing sales, marketing and distribution infrastructure;

- obtaining regulatory approvals for ALD1910 or any future product candidates that we discover and successfully develop;

- establishing and maintaining supply and manufacturing relationships with third parties;

- obtaining coverage and adequate reimbursement from third-party payors; and

- maintaining, protecting, expanding and enforcing our intellectual property, including intellectual property we license from third parties.

Because of the numerous risks and uncertainties associated with biologic product development, we are unable to predict the timing or amount of increased expenses and when we will be able to achieve or maintain profitability, if ever. In addition, our expenses could increase beyond expectations if we are required by the U.S. Food and Drug Administration, or FDA, or foreign regulatory agencies, to perform studies and trials in addition to those that we currently anticipate, or if there are any delays in our or any of our future collaborators' clinical trials or the development of any of our product candidates. If one or more of the product candidates that we independently develop is approved for commercial sale, we anticipate incurring significant costs associated with commercializing such product candidates.

We will need additional funds to support our operations, and such funding may not be available to us on acceptable terms, or at all, which would force us to delay, reduce or suspend our research and development programs and other operations or commercialization efforts.

We are primarily focused on the advancement of eptinezumab through the clinical development process to a commercial launch, as well as the advancement of the ALD1910 program and future product candidates. The completion of the development and the potential commercialization of our product candidates, should they receive regulatory approval, will require substantial funds.

As of December 31, 2017, we had $276.2 million in cash, cash equivalents and short-term investments, and $10.0 million in restricted cash. On January 12, 2018, we completed the sale of 725,268 shares of our convertible preferred stock at $137.88 per share in a private placement for net proceeds to Alder of approximately $97.7 million, after deducting fees and applicable expenses. In February 2018, we completed an underwritten public offering of our 2.50% convertible senior notes due 2025, or the Notes, resulting in net proceeds to Alder of approximately $277.7 million. We believe that our available cash, cash equivalents, short-term investments and restricted cash as of December 31, 2017, together with the proceeds from the January 2018 private placement of convertible preferred stock and February 2018 Notes offering, will be sufficient to achieve a U.S. commercial launch of eptinezumab on our expected schedule, assuming regulatory approval, and meet our projected operating requirements into 2020. We have based our estimate on the timing for our projected expenditures on assumptions that may prove to be wrong, and we could utilize our available capital resources sooner than we currently expect. Furthermore, our operating plans may change, and we may need additional funds to meet operational needs and capital requirements for product development and commercialization of eptinezumab sooner than planned. We will also need to obtain substantial

additional sources of funding to develop and commercialize ALD1910 and our other product candidates.

Our future financing requirements will depend on many factors, some of which are beyond our control, including the following:

- the rate of progress, recruitment and cost of our clinical trials and clinical success for eptinezumab, ALD1910 and any future product candidates;
- the timing of, and costs involved in, seeking and obtaining approvals from the FDA and other regulatory authorities;
- the costs of commercialization activities if any of our product candidates, such as eptinezumab, receive regulatory approval, including sales, marketing and distribution infrastructure;
- the degree and rate of market acceptance of any products launched by us or any of our future collaborators;
- repayment of the Notes, which mature on February 1, 2025, unless earlier repurchased, redeemed or converted.;

- our ability to enter into additional collaboration, licensing, commercialization or other arrangements and the terms and timing of such arrangements; and

- the emergence of competing technologies or other adverse market developments.

Because of the numerous risks and uncertainties associated with the development and commercialization of our product candidates and the extent to which we may enter into additional collaborations with third parties to participate in their development and commercialization, we are unable to estimate the amounts of increased capital outlays and operating expenditures associated with our current and anticipated clinical trials or with commercialization of our product candidates.

We do not have any material committed external source of funds or other support for our development efforts. Until we can generate sufficient revenues to finance our cash requirements, which we may never do, we expect to finance future cash needs through equity financings, debt financings, collaborations, strategic alliances, licensing arrangements and other marketing and distribution arrangements. There are no assurances that we will be able to raise sufficient amounts of funding on acceptable terms, or at all. If we raise additional capital through equity financings, the ownership interest of our existing stockholders will be diluted, and the terms of these securities may include liquidation or other preferences that adversely affect our stockholders' rights. If we raise additional capital through debt financings, we may be subject to covenants limiting or restricting our ability to take specific actions, such as incurring additional debt, buying or selling assets, making capital expenditures or declaring dividends. If we raise additional capital through marketing and distribution arrangements or other collaborations, strategic alliances or licensing arrangements with third parties, we may have to relinquish certain valuable rights to our product candidates, technologies, future revenue streams or research programs or grant licenses on terms that may not be favorable to us.

Furthermore, we may seek additional capital due to favorable market conditions or strategic considerations even if we believe we have sufficient funds for our current or future operating plans.

A failure to raise additional funding or to effectively implement cost reductions could harm our business, results of operations and future prospects.

Our significant level of indebtedness could limit cash flow available for our operations and expose us to risks that could adversely affect our business, financial condition and results of operations.

We incurred significant indebtedness and substantial debt service requirements as a result of our offering of the Notes in January 2018. In the future, we may incur additional indebtedness, including secured indebtedness, in connection with financing acquisitions, strategic transactions or for other purposes. The indenture governing the Notes does not limit the amount of debt that we or our subsidiaries may incur. Our indebtedness increases the risk that we may be unable to generate enough cash to pay amounts due in respect of our indebtedness, including the notes.

Our indebtedness could have important consequences to you and significant effects on our business. For example, it could:

- make it more difficult for us to satisfy our debt obligations, including the Notes;

- increase our vulnerability to general adverse economic and industry conditions;

- require us to dedicate a substantial portion of our cash flow from operations to payments on our indebtedness, thereby reducing the availability of our cash flow to fund working capital, capital expenditures and other general corporate purposes;

- limit our flexibility in planning for, or reacting to, changes in our business, the industry in which we operate or the general economy;

- restrict us from exploiting business opportunities;

- heighten our vulnerability to downturns in our business, our industry or in the general economy, and restrict us from exploiting business opportunities or making acquisitions;

- limit management's discretion in operating our business;

- place us at a competitive disadvantage compared to our competitors that have less indebtedness; and

- limit our availability to borrow additional funds for working capital, capital expenditures, acquisitions, debt service requirements, execution of our business strategy or other general purposes.

In addition, the agreements that may govern any future indebtedness that we may incur may contain financial and other restrictive covenants that will limit our ability to engage in activities that may be in our long-term best interests. Our failure to comply with those covenants could result in an event of default that, if not cured or waived, could result in the acceleration of all of our debt.

We may not be able to generate sufficient cash to service the Notes and any other debt we may incur, and may be forced to take other actions to satisfy our obligations under our debt, which may not be successful.

Our ability to make scheduled payments on or to refinance our debt obligations, including the Notes, and to fund future capital expenditures depends on our ability to generate cash in the future and our financial condition and operating performance, which are subject to prevailing economic and competitive conditions and to certain financial, business and other factors beyond our control. We cannot assure you that we will maintain a level of cash flows from operating activities sufficient to permit us to pay the principal, premium, if any, and interest on (as well as any cash due upon conversion of) our debt, including the Notes.

If our cash flows and capital resources are insufficient to fund our debt service obligations, we may be forced to adopt one or more alternatives, such as reducing or delaying investments and capital expenditures, or to selling assets, seeking additional capital or restructuring or refinancing our debt, including the notes. These alternative measures may not be successful and may not permit us to meet our scheduled debt service obligations. If our operating results and available cash are insufficient to meet our debt service obligations, we could face substantial liquidity problems and might be required to dispose of material assets or operations to meet our debt service and other obligations. We may not be able to consummate those dispositions or to obtain the proceeds that we could realize from them, and these proceeds may not be adequate to meet any debt service obligations then due. Further, we may need to refinance all or a portion of our debt on or before maturity, and we cannot assure you that we will be able to refinance any of our debt on commercially reasonable terms or at all.

The accounting method for convertible debt securities that may be settled in cash, such as the Notes, could have a material effect on our reported financial results.

Pursuant to Accounting Standards Codification Subtopic 470-20, Debt with Conversion and Other Options, which we refer to as ASC 470-20, an entity must separately account for the liability and equity components of the convertible debt instruments (such as the notes) that may be settled entirely or partially in cash upon conversion in a manner that reflects the issuer's economic interest cost. The effect of ASC 470-20 on the accounting for the Notes is that the equity component is required to be included in the additional paid-in capital section of shareholders' equity on our consolidated balance sheet and the value of the equity component would be treated as original issue discount for purposes of accounting for the debt component of the notes. As a result, we will be required to record a greater amount of non-cash interest expense in current periods presented as a result of the amortization of the discounted carrying value of the notes to their face amount over the term of the Notes. We will report greater losses in our financial statements because ASC 470-20 will require interest to include both the current period's amortization of the debt discount and the instrument's coupon interest, which could adversely affect our reported or future financial results, the market price of our common stock and the trading price of the Notes. In addition, there may be features within the terms that are considered to be an embedded derivative and could be recorded on the balance sheet at fair value as a liability. If it is determined to be an embedded derivative, we will be required to recognize changes in the derivative's fair value from period to period in other income (expense) in our statements of operations.

In addition, under certain circumstances, convertible debt instruments (such as the Notes) that may be settled entirely or partly in cash are currently accounted for utilizing the treasury stock method, the effect of which is that the shares

issuable upon conversion of the Notes are not included in the calculation of diluted earnings per share except to the extent that the conversion value of the Notes exceeds their principal amount. Under the treasury stock method, for diluted earnings per share purposes, the transaction is accounted for as if the number of our common stock that would be necessary to settle such excess, if we elected to settle such excess in shares, are issued. We cannot be sure that we will be able to use the treasury stock method or the accounting standards in the future will continue to permit the use of the treasury stock method. If we are unable to use the treasury stock method in accounting for the shares issuable upon conversion of the Notes, then our diluted earnings per share would be adversely affected.

The conditional conversion feature of the Notes, if triggered, may adversely affect our financial condition and operating results.

In the event the conditional conversion feature of the Notes is triggered, holders of Notes will be entitled to convert the Notes at any time during specified periods at their option. If one or more holders elect to convert their Notes, unless we elect to satisfy our conversion obligation by delivering solely shares of our common stock (other than paying cash in lieu of delivering any fractional

share), we would be required to settle a portion or all of our conversion obligation through the payment of cash, which could adversely affect our liquidity. In addition, even if holders do not elect to convert their Notes, we could be required under applicable accounting rules to reclassify all or a portion of the outstanding principal of the Notes as a current rather than long-term liability, which would result in a material reduction of our net working capital.

Our ability to use our net operating loss and tax credit carryforwards to offset future taxable income may be subject to certain limitations.

As of December 31, 2017, we had U.S. net operating loss carryforwards, or NOLs, of $643.1 million, for which we have recorded a full valuation allowance, which may be used to offset future taxable income. In addition, we have U.S. research and development tax credit carryforwards of $17.9 million. These NOLs and tax credit carryforwards expire in various years beginning in 2024, if not utilized. Utilization of the NOLs and tax credit carryforwards may be subject to an annual limitation due to historical or future ownership change rules pursuant to Sections 382 and 383 of the Internal Revenue Code, or the Code. We performed a section 382 ownership analysis through 2017 and determined that an ownership change occurred in 2015. Based on the analysis performed, however, we do not believe that the Section 382 annual limitation will impact our ability to utilize the tax attributes that existed as of the date of the ownership change in a material manner. If we have experienced an ownership change in the past or will experience an ownership change as a result of future changes in our stock ownership, some of which changes are outside our control, the tax benefits related to the NOLs and tax credit carryforwards may be further limited or lost.

The recently passed comprehensive tax reform legislation could adversely affect our business and financial condition.

On December 22, 2017, President Trump signed into law new tax legislation, the Tax Cuts and Jobs Act of 2017 (the "TCJA"), that significantly changes the Internal Revenue Code of 1986, as amended. The TCJA, among other things, contains significant changes to corporate taxation, including reduction of the corporate tax rate from a top marginal rate of 35% to a flat rate of 21%, limitation of the tax deduction for interest expense to 30% of adjusted earnings (except for certain small businesses), limitation of the deduction for net operating losses to 80% of current year taxable income and elimination of net operating loss carrybacks, one time taxation of offshore earnings at reduced rates regardless of whether they are repatriated, immediate deductions for certain new investments instead of deductions for depreciation expense over time, and modifying or repealing many business deductions and credits. Any federal net operating loss carryovers created in 2018 and thereafter will be carried forward indefinitely pursuant to the TCJA. We continue to examine the impact this tax legislation may have on our business. Notwithstanding the reduction in the corporate income tax rate, the overall impact of the TCJA is uncertain and our business and financial condition could be adversely affected. The impact of the TCJA on holders of our notes or common stock is also uncertain and could be adverse.

Risks Related to Eptinezumab and Our Other Product Candidates

If eptinezumab is not successfully commercialized, our business will be harmed.

Eptinezumab is our only product candidate currently in clinical trials. We have invested a significant portion of our efforts and financial resources into the development of eptinezumab to prevent migraines. Our ability to generate revenues from products, which we do not expect to occur for the foreseeable future, if ever, will depend heavily on the successful development, regulatory approval and eventual commercialization of eptinezumab. The success of eptinezumab and our other product candidates will depend on several factors, including the following:

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successful enrollment in, and completion of, clinical trials, including our PROMISE 1, PROMISE 2 and open-label Phase 3 clinical trials and the pharmacokinetic comparability study of our commercial supply of eptinezumab for our initial Biologics License Application, or BLA, submission;

- our ability to reach agreements with the FDA and other regulatory authorities on the appropriate regulatory path for approval for eptinezumab or other product candidates;

- receipt of approvals from the FDA and similar regulatory authorities outside the United States for eptinezumab or other product candidates;

- establishing commercial manufacturing arrangements with third parties;

- successfully launching sales, marketing and distribution of any product candidate that may be approved, whether alone or in collaboration with others;

- acceptance of any approved product by the medical community, third-party payors and patients and others involved in the reimbursement process, such as the Centers for Medicare and Medicaid Services in the United States and the National Institute of Clinical Excellence in the United Kingdom;

- effectively competing with other therapies;

- achieving a continued acceptable safety profile of the product following approval; and

- obtaining, maintaining, enforcing and defending intellectual property rights and claims, including intellectual property we license from third parties.

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 our product candidates, which would harm our business.

If clinical trials of eptinezumab or any of our other product candidates fail to demonstrate safety and efficacy to the satisfaction of the FDA or similar regulatory authorities outside the United States or do not otherwise produce positive results, we may incur additional costs or experience delays in completing, or ultimately be unable to complete, the development and commercialization of our product candidates.

Before obtaining regulatory approval for the sale of eptinezumab or any of our other product candidates, we or any of our future collaborators must conduct extensive clinical trials to demonstrate the safety and efficacy of our product candidates in humans. Clinical trials are expensive, difficult to design and implement, can take many years to complete and are uncertain as to outcome. A failure of one or more of such clinical trials could occur at any stage of evaluation. The outcome of preclinical 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.

In some cases, we utilize novel mechanisms of action to treat diseases that have not previously been addressed by antibody therapies. We or any of our future collaborators may experience numerous unforeseen events during, or as a result of, clinical trials that could delay or prevent our or any of our future collaborators' ability to receive regulatory approval or commercialize our product candidates, including the following:

- clinical trials of our product candidates, in particular our PROMISE 1, PROMISE 2 and open-label Phase 3 clinical trials, and the pharmacokinetic comparability study of our commercial supply of eptinezumab for our initial BLA submission, may produce negative or inconclusive results, and we or any of our future collaborators may decide, or regulators may require us, to conduct additional clinical trials or abandon product development programs;

- the number of patients required for clinical trials of our product candidates may be larger than we or any of our future collaborators anticipate, enrollment in these clinical trials may be insufficient or slower than anticipated or patients may drop out of these clinical trials at a higher rate than anticipated;

- the cost of clinical trials of our product candidates may be greater than anticipated;

- third-party contractors may fail to comply with regulatory requirements or meet their contractual obligations to us or any of our future collaborators in a timely manner, or at all;

- we or any of our future collaborators might have to suspend or terminate clinical trials of our product candidates for various reasons, including a finding that our product candidates have unanticipated serious side-effects or other unexpected characteristics or that the patients are being exposed to unacceptable health risks;

- regulators may not approve our or any of our future collaborators' proposed clinical development plans;

- regulators or institutional review boards may not authorize us, any of our future collaborators or our investigators to commence a clinical trial or conduct a clinical trial at a prospective site;

- regulators or institutional review boards may require that we, any of our future collaborators or our investigators suspend or terminate clinical research for various reasons, including noncompliance with regulatory requirements; and

- the supply or quality of our product candidates or other materials necessary to conduct clinical trials of our product candidates may be insufficient or inadequate.

If we or any of our future collaborators are required to conduct additional clinical trials or other testing of our product candidates beyond those currently contemplated, if we or any of our future collaborators are unable to successfully complete clinical trials of our product candidates 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, we or any of our future collaborators may:

- be delayed in obtaining regulatory approval for our product candidates;
- not obtain regulatory approval at all;
- obtain regulatory approval for indications that are not as broad as intended;
- have the product removed from the market after obtaining regulatory approval;
- be subject to additional post-marketing testing requirements; or
- be subject to restrictions on how the product is distributed or used.

Our product development costs will also increase if we experience delays in testing or approvals. We do not know whether any clinical trials will begin as planned, will need to be restructured or will be completed on schedule, or at all. Significant clinical trial delays also could shorten any periods during which we or any of our future collaborators may have the exclusive right to commercialize our product candidates or allow our competitors to bring products to market before we or any of our future collaborators do, which would impair our or any of our future collaborators' ability to commercialize our product candidates and harm our business and results of operations.

The development and commercialization of biologic products is subject to extensive regulation, and we may not obtain regulatory approvals for eptinezumab or any of our other product candidates.

The clinical development, manufacturing, labeling, packaging, storage, recordkeeping, advertising, promotion, export, import, marketing and distribution and other possible activities relating to eptinezumab, ALD1910 and any other product candidate that we may develop in the future are subject to extensive regulation in the United States. Biologics, like eptinezumab, require the submission of a BLA to the FDA and such product candidates are not permitted to be marketed in the United States until approval from the FDA of a BLA for that product has been obtained. A BLA must be supported by extensive preclinical and clinical data, as well as extensive information regarding chemistry, manufacturing and controls, or CMC, sufficient to demonstrate the safety, purity, potency and effectiveness of the applicable product candidate to the satisfaction of the FDA. We have not submitted an application for approval or obtained FDA approval for any product. This lack of experience may impede our ability to obtain FDA approval in a timely manner, if at all, for eptinezumab, ALD1910 and our future product candidates.

Regulatory approval of a BLA is not guaranteed, and the approval process is an expensive and uncertain process that may take several years. The FDA and foreign regulatory entities also have substantial discretion in the approval process. The number and types of preclinical studies and clinical trials that will be required for BLA approval varies depending on the product candidate, the disease or the condition that the product candidate is designed to target and the regulations applicable to any particular product candidate. Despite the time and expense associated with preclinical studies and clinical trials, failure can occur at any stage, and we could encounter problems that require us to repeat or perform additional preclinical studies or clinical trials or generate additional CMC data. The FDA and similar foreign authorities could delay, limit or deny approval of a product candidate for many reasons, including because they:

- may not deem the product candidate to be adequately safe or effective;
- may not find the data from preclinical studies, clinical trials or CMC data to be sufficient to support a claim of safety and efficacy;
- may not approve the manufacturing processes or facilities associated with the product candidate;

- may conclude that the long-term stability of the formulation of the drug product for which approval is being sought has been sufficiently demonstrated;

- may change approval policies or adopt new regulations; or

- may not accept a submission due to, among other reasons, the content or formatting of the submission.

To market any biologics outside of the United States, we and any of our future collaborators must comply with the numerous and varying regulatory and compliance related requirements of other countries. Approval procedures vary among countries and can involve additional product testing and additional administrative review periods, including obtaining reimbursement and pricing approval in select markets. The time required to obtain approval in other countries might differ from that required to obtain FDA approval. The regulatory approval process in other countries may include all of the risks associated with FDA approval as well as additional, presently unanticipated, risks. Regulatory approval in one country does not ensure regulatory approval in another, but a failure or delay in obtaining regulatory approval in one country may negatively impact the regulatory process in others, including the risk that our product candidates may not be approved for all indications requested and that such approval may be subject to limitations on the indicated uses for which the product may be marketed.

The results of clinical trials conducted at sites outside the United States may not be accepted by the FDA and the results or clinical trials conducted at sites inside the United States may not be accepted by international regulatory authorities.

We have conducted, and may in the future choose to conduct, our clinical trials outside the United States. Although the FDA may accept data from clinical trials conducted outside the United States, acceptance of this data is subject to certain conditions imposed by the FDA. For example, the clinical trial must be well-designed and conducted and performed by qualified investigators in accordance with ethical principles. The study population must also adequately represent the U.S. population, and the data must be applicable to the U.S. population and U.S. medical practice in ways that the FDA deems clinically meaningful. Generally, the patient population for any clinical trials conducted outside of the United States must be representative of the population for whom we intend to label the product in the United States. In addition, while these clinical trials are subject to the applicable local laws, FDA acceptance of the data will be dependent upon its determination that the trials also complied with all applicable U.S. laws and regulations. There can be no assurance the FDA will accept data from trials conducted outside of the United States. If the FDA does not accept the data from our international clinical trials, or if international regulatory authorities do not accept the data from our U.S. clinical trials, it would likely result in the need for additional trials, which would be costly and time-consuming and could delay or permanently halt the development of a product candidate.

We face substantial competition, and others may discover, develop or commercialize products before or more successfully than we do.

The development and commercialization of new therapeutic products is highly competitive. We face competition with respect to eptinezumab and our other current product candidates, and will face competition with respect to product candidates that we may seek to develop or commercialize in the future, from major pharmaceutical companies, specialty pharmaceutical companies and biotechnology companies worldwide. Our ability to compete may be affected in many cases by insurers or other third-party payors seeking to encourage the use of biosimilar products, which are expected to become available over the coming years. Many of our competitors are large pharmaceutical companies that have a greater ability to reduce prices for their competing drugs in an effort to maintain or gain market share and undermine the value proposition that drugs commercialized by us might otherwise be able to offer to payors.

Potential competitors also include academic institutions, government agencies and other public and private organizations that conduct research, seek patent protection and establish collaborative arrangements for research, development, manufacturing and commercialization. Many of these competitors are attempting to develop therapeutics for our target indications.

Currently in the United States, there are relatively few medications approved for the prevention of episodic and chronic migraines, and no approved drug procedure for prevention for disabling episodic migraine (by which we mean a healthcare provider-administered drug product falling under medical benefit reimbursement, as opposed to pharmacy benefit reimbursement). Most of the medications used today are generics that are prescribed for abortive treatment of migraines. Medications commonly used for prevention of episodic and chronic migraine include beta blockers such as propranolol, marketed by Wyeth, and other treatments such as topiramate, marketed by Johnson & Johnson, and sodium valproate, marketed by Divalproex. In addition, Botox, marketed by Allergan, is approved for the prevention of chronic migraine and commonly prescribed for disabling episodic migraine. There are also several other companies, Amgen Inc., Eli Lilly and Company, or Eli Lilly, and Teva Pharmaceuticals Industries Limited, or Teva, that are developing calcitonin gene-related peptide, or CGRP, blocking therapies using monoclonal antibodies similar to eptinezumab

designed for subcutaneous administration by patients. Other companies may be in later stages of development than we are or may progress their product candidates through clinical trials faster than our product candidates and, therefore, may obtain FDA or other regulatory approval for their products before we obtain approval for ours. We are aware that Amgen, Eli Lilly and Teva have announced that they have made BLA submissions in 2017 for their competing CGRP therapies, which, if approved, would enable them to commercialize their CGRP therapies before we are able to do so with eptinezumab.

Many of our competitors, including a number of large pharmaceutical companies that compete directly with us, 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. Our competitors may develop products that are more effective, safer, more convenient to administer or less costly than any that we are developing or that would render our product candidates obsolete or non-competitive. It is possible that our competitors might receive FDA or other regulatory approval for their products before us. Mergers and acquisitions in the pharmaceutical and biotechnology industries may result in even more resources being concentrated among a smaller number of our competitors. Smaller or early stage companies may also prove to be significant competitors, particularly through collaborative arrangements with large and established companies. These third parties compete with us in recruiting and retaining qualified scientific and management personnel, establishing clinical trial sites and patient enrollment for clinical trials, as well as in acquiring technologies complementary to, or necessary for, our programs.

Delays in the enrollment of patients in our clinical trials could increase our development costs and delay completion of the trials and delays in enrollment of patients in any of our future collaborators' clinical trials could delay completion of any of our future collaborators' trials.

We may not be able to initiate or continue clinical trials for eptinezumab or any of our other product candidates if we are unable to locate and enroll a sufficient number of eligible patients to participate in these trials as required by the FDA or other regulatory authorities. Even if we are able to enroll a sufficient number of patients in our clinical trials, if the pace of enrollment is slower than we expect, the development costs for our product candidates may increase and the completion of our trials may be delayed or our trials could become too expensive to complete.

We can provide no assurance that we will be able to enroll patients in any ongoing or planned clinical trial at a sufficient pace to complete the clinical trials within our projected time frame. Completing ongoing and future migraine trials will require us to continue to activate new clinical trial sites and to enroll patients at forecasted rates at both new and existing clinical trial sites. Our forecasts regarding the rates of clinical site activation and patient enrollment at those sites are based on a number of assumptions, including assumptions based on experience with prior eptinezumab clinical trials. However, there can be no assurance that those forecasts will be accurate or that we will complete our ongoing and planned eptinezumab trials on schedule. During the initial months of our clinical trials, the number of clinical sites activated and the number of patients enrolled at each clinical site per month could be lower than we have forecasted and, as a result, we might need to make a number of adjustments to the clinical trial plan, including increasing the number of clinical trial sites. We can provide no assurance that those adjustments will be sufficient to enable us to complete the trials within our anticipated time frame. In addition, we may determine it necessary to increase the target number of patients to be enrolled in a clinical trial, which could extend the time necessary to complete such clinical trial. If we experience delays in enrollment, our ability to complete the trials could be materially adversely affected.

If serious adverse events, or SAEs, are identified during the development of eptinezumab or any of our product candidates, we or any of our future collaborators may need to abandon development of that product candidate.

Our most advanced product candidate, eptinezumab, is still in clinical development and its risk of failure is high. It is impossible to predict when or if eptinezumab or any of our existing or future product candidates will prove effective and safe enough to receive regulatory approval.

Various SAEs have been observed across all clinical trials to date for eptinezumab. The relevant clinical investigators concluded that all observed SAEs to date were found to be unrelated to eptinezumab. We have observed some injection-site reactions, or ISRs, in Phase 1 clinical trials of subcutaneous and intramuscular injections of eptinezumab. Additional studies or requirements from the FDA for future studies may be necessary to address these ISRs.

There can be no assurance that our ongoing or planned trials for eptinezumab will not fail due to safety issues. In such an event, we might need to abandon development of eptinezumab.

We rely on third parties to conduct and support our clinical trials, and those third parties may not perform satisfactorily, including failing to meet deadlines for the completion of such trials.

We do not independently conduct clinical trials for our product candidates. We rely on third parties, such as contract research organizations, or CROs, clinical data management organizations, medical institutions and clinical investigators, to perform this function. Our reliance on these third parties for clinical development activities reduces our control over these activities but does not relieve us of our responsibilities. Furthermore, some of the sites for our clinical trials are outside the United States. The performance of these sites may be adversely affected by various issues, including less advanced medical infrastructure, lack of familiarity with conducting clinical trials in accordance with U.S. standards, insufficient training of personnel, communication difficulties or change in local regulations. We remain responsible for ensuring that each of our clinical trials is conducted in accordance with the general investigational plan and protocols for the study. Moreover, the FDA requires us to comply with standards, commonly referred to as Good Clinical Practices, or GCP, for conducting, recording and reporting the results of clinical trials to assure that data and reported results are credible and accurate and that the rights, integrity and confidentiality of patients in clinical trials are protected. Furthermore, these third parties may also have relationships with other entities, including our competitors. If these third parties do not successfully carry out their contractual duties, meet expected deadlines or conduct our clinical trials in accordance with regulatory requirements or our stated protocols, we will not be able to obtain, or may be delayed in obtaining, regulatory approvals for our product candidates and will not be able to, or may be delayed in our efforts to, successfully commercialize our products.

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

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

The process of manufacturing our products is complex, highly-regulated and subject to multiple risks. The manufacture of biologics involves complex processes, including developing cells or cell systems to produce the biologic, growing large quantities of such cells and harvesting and purifying the biologic produced by them. As a result, the cost to manufacture biologics is generally far higher than traditional small molecule chemical compounds, and the biologics manufacturing process is less reliable and is difficult to reproduce. Manufacturing biologics, such as eptinezumab and other product candidates, is highly susceptible to product loss due to contamination, equipment failure, improper installation or operation of equipment, vendor or operator error, inconsistency in yields, variability in product characteristics and difficulties in scaling the production process. Even minor deviations from normal manufacturing processes could result in reduced production yields, product defects and other supply disruptions. If microbial or other contaminations are discovered in our product candidates or in the manufacturing facilities in which our product candidates are made, such manufacturing facilities may need to be closed for an extended period of time to investigate and remedy the contamination. We utilize third-party CMOs to produce eptinezumab using our proprietary yeast production technology.

The manufacturing facilities in which our product candidates are made could be adversely affected by equipment failures, labor shortages, natural disasters, power failures and numerous other factors. There are risks associated with scaling-up manufacturing to commercial scale including, among others, cost overruns, potential problems with process scale-up, process reproducibility, stability issues, lot consistency and timely availability of raw materials. Even if we or any of our future collaborators obtain regulatory approval for any of our product candidates, there is no

assurance that manufacturers will be able to manufacture the approved product to specifications acceptable to the FDA or other regulatory authorities, to produce it in sufficient quantities to meet the requirements for the potential launch of the product or to meet potential future demand. If our or any of our future collaborators' manufacturers are unable to produce sufficient quantities of an approved product for commercialization, commercialization efforts would be impaired, which would have an adverse effect on our business, financial condition, results of operations and growth prospects.

We historically relied on a single smaller scale CMO to manufacture and provide us with clinical supplies of eptinezumab. We have entered into agreements with other CMOs to manufacture eptinezumab drug substance and drug product at larger scale as we prepare for commercialization. We are conducting a pharmacokinetic comparability study of our initial commercial supply of eptinezumab for our BLA submission planned for the second half of 2018. We expect to use eptinezumab manufactured by our commercial suppliers in future clinical studies. We anticipate there will be continued interaction with additional CMOs as we advance other product candidates. Scaling up a biologic manufacturing process is a difficult and uncertain task, and we may not be successful in transferring our production system or a manufacturer may not have the necessary capabilities to complete the implementation and development process. If we are unable to adequately validate or scale-up the manufacturing process for eptinezumab with a manufacturer, we will need to transfer to another manufacturer and complete the manufacturing validation process, which can be lengthy. If we are able to adequately validate and scale-up the manufacturing process for eptinezumab or other product candidates

with a manufacturer, we will still need to negotiate with such manufacturer an agreement for commercial supply and it is not certain we will be able to come to agreement on terms acceptable to us.

Our yeast-based production system used for the manufacture of eptinezumab is a non-traditional antibody production platform and as we or any of our future collaborators produce product in commercial quantities, we or any such collaborators may experience unforeseen safety or other manufacturing issues which would adversely affect the commercialization of eptinezumab or any of our future product candidates.

We rely on third-party CMOs to manufacture and supply eptinezumab. If one of our suppliers or manufacturers fails to perform adequately or fulfill our needs, we may be required to incur significant costs and devote significant efforts to find new suppliers or manufacturers and may also face delays in the development and commercialization of our product candidates.

We currently do not own manufacturing facilities for clinical-scale manufacturing of our product candidates and we rely upon third-party CMOs to manufacture and supply drug product for our clinical trials. The manufacture of pharmaceutical products in compliance with the FDA's current good manufacturing practices, or cGMP, requires significant expertise and capital investment, including the development of advanced manufacturing techniques and process controls. Manufacturers of pharmaceutical products often encounter difficulties in production, including difficulties with production costs and yields, quality control, including stability of the product candidate and quality assurance testing, shortages of qualified personnel, as well as compliance with strictly enforced cGMP requirements, other federal and state regulatory requirements and foreign regulations. If our manufacturers were to encounter any of these difficulties or otherwise fail to comply with their obligations to us or under applicable regulations, our ability to provide study drugs in our clinical trials would be jeopardized. Any delay or interruption in the supply of clinical trial materials could delay the completion of our clinical trials, increase the costs associated with maintaining our clinical trial programs and, depending upon the period of delay, require us to commence new trials at significant additional expense or terminate the trials completely.

All manufacturers of our product candidates must comply with cGMP requirements enforced by the FDA through its facilities inspection program. These requirements include, among other things, quality control, quality assurance and the maintenance of records and documentation. Manufacturers of our product candidates may be unable to comply with these cGMP requirements and with other FDA, state and foreign regulatory requirements. The FDA or similar foreign regulatory agencies may also implement new standards at any time, or change their interpretation and enforcement of existing standards for manufacture, packaging or testing of products. We have little control over our manufacturers' compliance with these regulations and standards. A failure to comply with these requirements may result in fines and civil penalties, suspension of production, suspension or delay in product approval, product seizure or recall or withdrawal of product approval. If the safety of any product supplied is compromised due to our manufacturers' failure to adhere to applicable laws or for other reasons, we may not be able to obtain regulatory approval for or successfully commercialize our products and we may be held liable for any injuries sustained as a result. Any of these factors could cause a delay of clinical trials, regulatory submissions, approvals or commercialization of our product candidates, entail higher costs or impair our reputation.

We historically relied on a single smaller scale CMO to manufacture and provide us with clinical supplies of eptinezumab. We have entered into agreements with other CMOs to manufacture eptinezumab drug substance and drug product at larger scale as we prepare for commercialization. We anticipate there will be continued interaction with additional CMOs as we advance other product candidates. Our current agreements do not, and our future agreements may not, provide for an entire supply of the drug product necessary for all anticipated clinical trials or for full-scale commercialization. If we and our suppliers cannot agree to the terms and conditions for provision of the drug product necessary for our clinical and commercial supply needs, or if a manufacturer terminates their agreement in response to a breach by us or otherwise becomes unable to fulfill its supply obligations, our clinical trials and

commercialization efforts could be delayed until a qualified alternative supplier is identified, the manufacturing process is qualified and validated and we have agreed on the terms and conditions for such alternative supplier to supply product for us, which would have an adverse impact on our business and prospects.

Eptinezumab is a biologic and therefore requires complex production processes. Transferring the production process to a new manufacturer would be particularly difficult, time-consuming and expensive and may not yield comparable product. Although alternative sources of supply exist, the number of third-party suppliers with the necessary manufacturing and regulatory expertise and facilities necessary to manufacture eptinezumab and any other product candidates we may develop is limited, and may be expensive and take a significant amount of time to arrange for alternative suppliers. New suppliers of any product candidate would be required to qualify under applicable regulatory requirements. Obtaining the necessary FDA approvals or other qualifications under applicable regulatory requirements could result in a significant interruption of supply and could require the new manufacturer to bear significant additional costs which may be passed on to us. Our CMC activities supporting our planned BLA submission for eptinezumab include a pharmacokinetic comparability study in 2018 to ensure commercial readiness of supply upon launch. In the event that eptinezumab from our initial commercial supply performs differently from our clinical supply of eptinezumab in this comparability study, we may

be required to conduct additional studies to understand such differences. The scope of any such additional studies could delay or otherwise have an adverse impact on our BLA and commercialization plans and timing.

Even if eptinezumab or any of our other product candidates receive regulatory approval, they may fail to achieve the degree of market acceptance by physicians, patients, healthcare payors and others in the medical community necessary for commercial success.

If eptinezumab or any of our other product candidates receive regulatory approval, they may nonetheless fail to gain sufficient market acceptance by physicians, patients, healthcare payors and others in the medical community. The degree of market acceptance of our product candidates, if approved for commercial sale, will depend on a number of factors, including the following:

- the efficacy and potential advantages compared to alternative treatments;
- the prevalence and severity of any side-effects;
- the price we or any of our future collaborators charge for our products;
- the availability of third-party coverage and adequate reimbursement;
- the convenience and ease of administration compared to alternative treatments;
- the willingness of the target patient population to try new therapies and of physicians to prescribe these new therapies; and
- the size and effectiveness of our sales, marketing and distribution support.

If our product candidates are approved and do not achieve an adequate level of acceptance, we may not generate significant product revenues and we may not become profitable on a sustained basis.

We currently have no sales or distribution personnel or infrastructure and only limited marketing capabilities. If we are unable to develop a sales, marketing and distribution infrastructure on our own or through collaborations or other marketing arrangements, we will not be successful in commercializing eptinezumab or any of our future products.

We do not currently have sales or distribution capabilities and have no experience as an organization in the sale, marketing and distribution of therapeutic products. To achieve commercial success for any approved product, we must either develop a sales and marketing organization or outsource these functions to third parties. Assuming regulatory approval, we plan to focus our initial commercialization efforts on high-prescribing neurologists and headache centers in the United States employing a specialty sales force that we plan to establish. To maximize the potential commercial opportunity of eptinezumab while we focus on the U.S. specialty market, we may explore strategic arrangements that provide additional capabilities and infrastructure while improving access for physicians and patients.

There are risks involved with both establishing our own sales and marketing capabilities and entering into arrangements with third parties to perform these services. For example, recruiting and training a sales force is

expensive and time-consuming and could delay any product launch. If the commercial launch of a product for which we recruit a sales force and establish marketing capabilities is delayed or does not occur for any reason, we would have prematurely or unnecessarily incurred these commercialization expenses. This may be costly, and our investment would be lost if we do not have another product to sell in the same specialty market. We also may not be successful entering into arrangements with third parties to sell and market our product candidates or may be unable to do so on terms that are favorable to us. We likely will have little control over such third parties, and any of them may fail to devote the necessary resources and attention to sell and market our products effectively and could damage our reputation. If we do not establish sales and marketing capabilities successfully, either on our own or in collaboration with third parties, we will not be successful in commercializing eptinezumab or any other product candidates.

If we are able to commercialize eptinezumab or any other product candidates, the products may become subject to unfavorable pricing regulations or third-party reimbursement practices, thereby harming our business.

The regulations that govern pricing and reimbursement for new therapeutic products vary widely from country to country. Some countries require approval of the sale price of a product before it can be marketed. In many countries, the pricing review period begins

after marketing or product licensing approval is granted. In some foreign markets, prescription pharmaceutical pricing remains subject to continuing governmental control even after initial approval is granted. As a result, we or any of our future collaborators might obtain regulatory approval for a product in a particular country, but then be subject to price regulations that delay commercial launch of the product and negatively impact the revenues we are able to generate from the sale of the product in that country. Adverse pricing limitations may hinder our ability to recoup our investment in our products, even if our product candidates obtain regulatory approval.

Our and any of our future collaborators' ability to commercialize any product candidates successfully also will depend in significant part on the extent to which coverage and adequate reimbursement for these products and related treatments becomes available from government health administration authorities, private health insurers and other third-party payors. Third-party payors decide which medications they will cover and establish reimbursement levels. A primary focus in the U.S. healthcare industry and elsewhere is cost containment. Increasingly, third-party payors are requiring that companies provide them with predetermined discounts from list prices and are challenging the prices charged for medical products. We cannot be sure that coverage will be available for any product that we or any of our future collaborators commercialize and, if coverage is available, what the level of reimbursement will be. Further, one payor's determination to provide coverage for a product does not assure that other payors will also provide coverage for the product. Adequate third-party reimbursement may not be available to enable us to maintain price levels sufficient to realize an appropriate return on our investment in product development.

Reimbursement may impact the demand for, or the price of, any product for which we or any of our future collaborators obtain approval. Obtaining coverage and adequate reimbursement for our products may be particularly difficult because of the higher prices often associated with products administered under the supervision of a physician. If reimbursement is not available or is available only to limited levels, we or any of our future collaborators may not be able to successfully commercialize any product that has been approved.

There may be significant delays in obtaining reimbursement for newly approved products, and coverage may be more limited than the purposes for which the product is approved by the FDA or regulatory authorities in other countries. Moreover, eligibility for reimbursement does not imply that any product will be paid for in all cases or at a rate that covers our or any of our future collaborators' costs, including research, development, manufacture, sale and distribution. Interim payments for new products, if applicable, may also not be sufficient to cover our or any of our future collaborators' costs and may not be made permanent. Payment rates may vary according to the use of the product and the clinical setting in which it is used, may be based on payments allowed for lower cost products that are already reimbursed and may be incorporated into existing payments for other services. Net prices for products may be reduced by mandatory discounts or rebates required by government healthcare programs or private payors and by any future relaxation of laws that presently restrict imports of products from countries where they may be sold at lower prices than in the United States. Private third-party payors often rely upon Medicare coverage policy and payment limitations in setting their own reimbursement policies. Our or any of our future collaborators' inability to promptly obtain coverage and profitable payment rates from both government funded and private payors for newly developed products could have a material adverse effect on our operating results, our ability to raise capital needed to commercialize products and our overall financial condition.

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

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

- decreased demand for any product candidates or products that we or any of our future collaborators may develop;
- injury to our reputation and significant negative media attention;
- withdrawal of patients from clinical trials or cancellation of trials;
- significant costs to defend the related litigation;
- substantial monetary awards;
- loss of revenues; and

- the inability to commercialize any products that we may develop.

We currently have $20 million in product liability insurance coverage for our clinical trials, which may not be adequate to cover all liabilities that we may incur. Insurance coverage is increasingly expensive. We may not be able to maintain insurance coverage at a reasonable cost or in an amount adequate to satisfy any liability that may arise.

Marketing approval of our product candidates in international markets will subject us to additional costs and a variety of risks associated with international operations.

We intend to pursue marketing approvals for our product candidates in international markets directly or with partners and will be subject to additional costs and additional risks related to international operations, including:

- different regulatory requirements for drug approvals in foreign countries;
- reduced protection for intellectual property rights;
- unexpected changes in tariffs, trade barriers and regulatory requirements;
- economic weakness, including inflation or political instability in particular foreign economies and markets;
- compliance with tax, employment, immigration and labor laws for employees living or traveling abroad;
- foreign taxes, including withholding of payroll taxes;
- foreign currency fluctuations, which could result in increased operating expenses and reduced revenues, and other obligations incident to doing business in another country;
- workforce uncertainty in countries where labor unrest is more common than in the United States;
- production shortages resulting from any events affecting raw material supply or manufacturing capabilities abroad;
- the impact of the vote by the United Kingdom decided by referendum to leave the European Union (commonly referred to as “Brexit”); and
- business interruptions resulting from geopolitical actions, including war and terrorism, or natural disasters including earthquakes, typhoons, floods and fires.

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

Because we have limited financial and managerial resources, we focus our research programs and product candidates for a specific disease. As a result, we may forego or delay pursuit of opportunities with other product candidates or other diseases that may later prove to have greater commercial potential. Our resource allocation decisions may cause us to fail to capitalize on viable commercial products or profitable market opportunities. Our spending on current and future research and development programs and product candidates for specific diseases may not yield any commercially viable products.

If we do not accurately evaluate the commercial potential for a particular product candidate in the right disease, we may relinquish valuable rights to that product candidate through collaboration, licensing or other royalty arrangements in cases in which it would have been advantageous for us to retain sole development and commercialization rights.

We may not be successful in our efforts to use and enhance our proprietary antibody platform to create a pipeline of product candidates and develop commercially successful products.

We have used our proprietary antibody platform for the selection of monoclonal antibodies to create eptinezumab, ALD1910 and other future product candidates that we are currently evaluating. We are at an early stage of development and our platform has not yet, and may never, lead to approved or commercially successful products. Even if we are successful in continuing to build our pipeline, the future product candidates that we evaluate may not be suitable for clinical development, including as a result of their harmful side-effects, limited efficacy or other characteristics that make it unlikely such product candidates will receive regulatory approval or achieve commercial success. If we do not successfully develop and commercialize product candidates using our proprietary antibody platform, we may not be able to obtain product or collaboration revenues in future periods, which would harm our business and prospects.

If any future collaborations for the development and commercialization of product candidates are not successful, our business may be harmed.

We may choose to enter into collaboration agreements with third parties with respect to our product candidates, including eptinezumab, for their development and commercialization in the United States or in international markets. We will have limited control over the amount and timing of resources that any of our future collaborators dedicate to the development or commercialization of our product candidates. Our ability to generate revenues from these arrangements will depend in part on any such collaborators' abilities to successfully perform the functions assigned to them in these arrangements.

Collaborations involving our product candidates are subject to numerous risks, which may include the following:

- collaborators may have significant discretion in determining the efforts and resources that they will apply to collaborations;

- collaborators may not pursue development and commercialization of our 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;

- collaborators may delay clinical trials, provide insufficient funding for a clinical trial, 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;

- 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 not properly maintain or defend our intellectual property rights or may use our intellectual property or proprietary information in a way that gives rise to actual or threatened litigation that could jeopardize or invalidate our intellectual property or proprietary information or expose us to potential liability;

- disputes may arise between us and a collaborator that cause the delay or termination of the research, development or commercialization of our product candidates or that result in costly litigation or arbitration that diverts management attention and resources;

- collaborations may be terminated and, if terminated, may result in a need for additional capital to pursue further development or commercialization of the applicable product candidates; and

- 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 commercialize such intellectual property.

Any termination or disruption of any future collaboration could result in delayed development of product candidates, increased cost to develop product candidates or termination of development of a product candidate.

We may engage in future acquisitions that 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 strategic transactions, including licensing or acquiring complementary products, technologies or businesses. Any potential acquisitions may entail numerous risks, including increased operating expenses and cash requirements, assimilation of operations and products, retention of key employees, diversion of our management's attention and uncertainties in our ability to maintain key business relationships of the acquired entities. 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.

Risks Related to Government Regulation

The regulatory approval process is expensive, time consuming and uncertain and may prevent us or our any of our future collaboration partners from obtaining approvals for the commercialization of some or all of our product candidates.

Among other things, the research, testing, manufacturing, labeling, approval, selling, import, export, marketing and distribution of drug products are subject to extensive regulation by the FDA and other regulatory authorities in the United States and other countries, which regulations differ from country to country. Neither we nor any future collaboration partner is permitted to market our product candidates in the United States until we receive approval of a BLA from the FDA. We have not submitted an application or received marketing approval for any of our product candidates. Obtaining approval of BLA can be a lengthy, expensive and uncertain process. In addition, failure to comply with FDA and other applicable U.S. and foreign regulatory requirements may subject us to administrative or judicially imposed sanctions, including the following:

- warning letters;
- civil or criminal penalties and fines;
- injunctions;
- suspension or withdrawal of regulatory approval;
- suspension of any ongoing clinical trials;
- voluntary or mandatory product recalls and publicity requirements;
- refusal to accept or approve applications for marketing approval of new drugs or biologics or supplements to approved applications 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 any of our product candidates in the United States or abroad, we and any of our future collaboration partners must demonstrate with substantial evidence from well-controlled clinical trials, and to the satisfaction of the FDA and other regulatory authorities abroad, that such product candidates are safe and effective for their intended uses. Results from preclinical studies and clinical trials can be interpreted in different ways. Even if we and any of our future collaboration partners believe the preclinical or clinical data for our product candidates are promising, such data may not be sufficient to support approval by the FDA and other regulatory authorities. Administering any of 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 our product candidates for any or all targeted indications.

Regulatory approval of 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 approve our or our third-party manufacturers' processes or facilities; or
- the FDA may change its approval policies or adopt new regulations.

If any of our product candidates fails to demonstrate safety and efficacy in clinical trials or does not gain regulatory approval, our business will be harmed.

Even if we receive regulatory approval for a product candidate, we will be subject to ongoing regulatory obligations and continued regulatory review, which may result in significant additional expense and subject us to penalties if we fail to comply with applicable regulatory requirements.

Once regulatory approval has been granted, the approved product and its manufacturer are subject to continual review by the FDA and/or non-U.S. regulatory authorities. Any regulatory approval that we or any of our future collaboration partners receive for our product candidates may be subject to limitations on the indicated uses for which the product may be marketed or contain requirements for potentially costly post-marketing follow-up trials to monitor the safety and efficacy of the product. In addition, if the FDA and/or non-U.S. regulatory authorities approve any of our product candidates, we will be subject to extensive and ongoing regulatory requirements by the FDA and other regulatory authorities with regard to the labeling, packaging, adverse event reporting, storage, advertising, promotion and recordkeeping, among other things, for our products. In addition, manufacturers of our drug products are required to comply with cGMP regulations, which include requirements related to quality control and quality assurance as well as the corresponding maintenance of records and documentation. Furthermore, regulatory authorities must approve these manufacturing facilities before they can be used to manufacture our drug products, and these facilities are subject to continual review and periodic inspections by the FDA and other regulatory authorities for compliance with cGMP regulations. If we or a third party discover previously unknown problems with a product, such as adverse events of unanticipated severity or frequency, or problems with the facility where the product is manufactured, a regulatory authority may impose restrictions on that product, the manufacturer or us, including requiring withdrawal of the product from the market or suspension of manufacturing. If we, our product candidates or the manufacturing facilities for our product candidates fail to comply with regulatory requirements of the FDA and/or other non-U.S. regulatory authorities, we could be subject to administrative or judicially imposed sanctions, including the following:

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

- injunctions;

- suspension or withdrawal of regulatory approval;

- suspension of any ongoing clinical trials;

- voluntary or mandatory product recalls and publicity requirements;

- refusal to approve pending applications for marketing approval of new drugs or supplements to approved applications filed by us;

- restrictions on operations, including costly new manufacturing requirements; or

- seizure or detention of our products or import bans.

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

Failure to obtain regulatory approvals in foreign jurisdictions will prevent us from marketing our products in these jurisdictions.

We or a future collaboration partner may market eptinezumab and any future products in international markets. In order to market our future products in the European Economic Area, or EEA, and many other foreign jurisdictions, we must obtain separate regulatory approvals. Specifically, in the EEA, medicinal products can only be commercialized after obtaining a Marketing Authorization, or MA.

Before granting the MA, the European Medicines Agency, or EMA, or the competent authorities of the member states of the EEA make an assessment of the risk-benefit balance of the product on the basis of scientific criteria concerning its quality, safety and efficacy.

We have had limited interactions with foreign regulatory authorities, and the approval procedures vary among countries and can involve additional clinical testing, and the time required to obtain approval may differ from that required to obtain FDA approval. Clinical trials conducted in one country may not be accepted by regulatory authorities in other countries. Approval by the FDA does not ensure approval by regulatory authorities in other countries, and approval by one or more foreign regulatory authorities does not ensure approval by regulatory authorities in other foreign countries or by the FDA. However, a failure or delay in obtaining regulatory approval in one country may have a negative effect on the regulatory process in others. The foreign regulatory approval process may include all of the risks associated with obtaining FDA approval. We may not obtain foreign regulatory approvals on a timely basis, if at all. We may not be able to file for regulatory approvals and even if we file we may not receive necessary approvals to commercialize our products in any market.

Healthcare reform measures could hinder or prevent our product candidates' commercial success.

In the United States, there have been and we expect there will continue to be a number of legislative and regulatory changes to the healthcare system in ways that could affect our future revenues and profitability and the future revenues and profitability of our potential customers. Federal and state lawmakers regularly propose and, at times, enact legislation that would result in significant changes to the healthcare system, some of which are intended to contain or reduce the costs of medical products and services, improve quality of care, and expand access to coverage. For example, one of the most significant healthcare reform measures in decades, the Patient Protection and Affordable Care Act, as amended by the Health Care and Education Reconciliation Act, collectively, the ACA, was enacted in 2010. The ACA contains a number of provisions, including those governing enrollment in federal healthcare programs, reimbursement changes and fraud and abuse measures. However, in January 2017, President Trump 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 Congress, the U.S. House of Representatives passed ACA replacement legislation known as the American Health Care Act of 2017 in May 2017, which was not introduced in the Senate. More recently, the Senate Republicans have proposed multiple bills to repeal and replace portions of the ACA. Although none of these measures have been enacted, Congress may consider other legislation to repeal or replace certain elements of the ACA. On October 12, 2017, President Trump signed another Executive Order directing certain federal agencies to propose regulations or guidelines to permit small businesses to form association health plans, expand the availability of short-term, limited duration insurance, and expand the use of health reimbursement arrangements, which may circumvent some of the requirements for health insurance mandated by the ACA. We cannot know how efforts to repeal and replace the ACA or any future healthcare reform legislation will impact our business.

In addition, other legislative changes have been proposed and adopted since the ACA was enacted. For example, the Budget Control Act of 2011, among other things, created the Joint Select Committee on Deficit Reduction to

recommend proposals in spending reductions to Congress. The Joint Select Committee did not achieve a targeted deficit reduction of at least $1.2 trillion for the years 2013 through 2021, which triggered the legislation's automatic reduction to several government programs, including aggregate reductions to Medicare payments to providers of up to 2% per fiscal year that went into effect on April 1, 2013, following passage of the Bipartisan Budget Act of 2015, and will remain in effect through 2025 unless additional Congressional action is taken. On January 2, 2013, President Obama signed into law the American Taxpayer Relief Act of 2012, or the ATRA, which, among other things, further reduced Medicare payments to several providers, including hospitals, and increased the statute of limitations period for the government to recover overpayments to providers from three to five years.

There have been and likely will continue to be legislative and regulatory proposals at the federal and state levels directed at containing or lowering the cost of health care. For example, there has been increasing legislative and enforcement interest in the United States with respect to specialty drug pricing practices. Specifically, there have been several recent U.S. Congressional inquiries and proposed bills designed to, among other things, bring more transparency to drug pricing, review the relationship between pricing and manufacturer patient programs, and reform government program reimbursement methodologies for drugs. We cannot predict the

initiatives that may be adopted in the future or their full impact. The continuing efforts of the government, insurance companies, managed care organizations and other payors of healthcare services to contain or reduce costs of health care may adversely affect:

- our ability to set a price we believe is fair for our products;
- our ability to generate revenues and achieve or maintain profitability; and
- the availability of capital for our business.

Furthermore, changes in regulatory requirements and guidance may occur and we may need to amend clinical trial protocols to reflect these changes. Amendments may require us to resubmit our clinical trial protocols to Institutional Review Boards for reexamination, which may impact the costs, timing or successful completion of a clinical trial. Data from clinical trials may receive greater scrutiny with respect to safety, which may make the FDA or other regulatory authorities more likely to terminate or suspend clinical trials before completion, or require longer or additional clinical trials that may result in substantial additional expense and a delay or failure in obtaining approval or approval for a more limited indication than originally sought.

Given the serious public health risks of high profile adverse safety events with certain drug products, the FDA may require, as a condition of approval, costly risk evaluation and mitigation strategies, which may include safety surveillance, restricted distribution and use, patient education, enhanced labeling, special packaging or labeling, expedited reporting of certain adverse events, preapproval of promotional materials and restrictions on direct-to-consumer advertising.

If we fail to comply with healthcare laws, we could face substantial penalties and our business, operations and financial condition could be adversely affected.

Even though we do not and will not control referrals of healthcare services or bill directly to Medicare, Medicaid or other third-party payors, certain federal and state healthcare laws and regulations, including those pertaining to fraud and abuse and patients' rights, are and will be applicable to our business. We could be subject to healthcare regulation by both the federal government and the states in which we conduct our business. The healthcare laws and regulations that may affect our ability to operate include, without limitation:

- the federal Anti-Kickback Statute, which prohibits, among other things, any person or entity from knowingly and willfully offering, soliciting, receiving or providing remuneration, directly or indirectly, in exchange for or to induce either the referral of an individual for, or the purchase, order or recommendation of, any good or service for which payment may be made under federal healthcare programs, such as the Medicare and Medicaid programs;
- federal false claims laws, including the federal civil False Claims Act, which prohibit, among other things, individuals or entities from knowingly presenting, or causing to be presented, claims for payment that are false or fraudulent, or knowingly making false statements to avoid, decrease, or conceal an obligation to pay money to the federal government;

- the federal Health Insurance Portability and Accountability Act of 1996, or HIPAA, which imposes criminal and civil liability for, among other things, executing a scheme to defraud any healthcare benefit program or making false statements relating to healthcare matters;

- the federal Physician Payments Sunshine Act under the ACA, which requires certain manufacturers of drugs, devices, biologics and medical supplies for which payment is available under Medicare, Medicaid, or the Children's Health Insurance Program to annually report to the U.S. Department of Health and Human Services' Centers for Medicare & Medicaid Services, or CMS, information related to payments and other transfers of value provided to physicians and teaching hospitals and physician ownership and investment interests;

- HIPAA, as amended by the Health Information Technology for Economic and Clinical Health Act, which imposes requirements on certain types of entities and individuals regarding the conduct of certain electronic healthcare transactions and the security and privacy of protected health information; and

- state law equivalents of each of the above federal laws, such as anti-kickback and false claims laws which may apply to items or services reimbursed by any third-party payor, including commercial insurers; state laws that require pharmaceutical companies to comply with the pharmaceutical industry's voluntary compliance guidelines and the relevant compliance guidance promulgated by the federal government; state laws that require drug manufacturers to report information related to payments and other transfers of value to other healthcare providers and healthcare entities, or marketing expenditures; and

state and foreign laws governing the privacy and security of health information in some circumstances, many of which differ from each other in significant ways and often are not preempted by HIPAA, thus complicating compliance efforts.

The ACA, among other things, amends the intent requirement of the federal Anti-Kickback Statute and criminal healthcare fraud statutes. A person or entity no longer needs to have actual knowledge of this statute or specific intent to violate it in order to commit a violation. In addition, the ACA provides that the government may assert that a claim including items or services resulting from a violation of the federal Anti-Kickback Statute constitutes a false or fraudulent claim for purposes of the False Claims Act.

If our operations are found to be in violation of any of the laws described above or any other governmental regulations that apply to us, we may be subject to penalties, including administrative, civil and criminal penalties, damages, fines, disgorgement, individual imprisonment, exclusion from participation in federal healthcare programs, integrity obligations, contractual damages, reputational harm, diminished profits and future earnings, and the curtailment or restructuring of our operations, which could adversely affect our ability to operate our business and our financial results. 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. Moreover, achieving and sustaining compliance with applicable federal and state privacy, security and fraud laws may prove costly.

Risks Related to Intellectual Property

If we fail to comply with our obligations in our intellectual property licenses with third parties, we could lose license rights that are important to our business.

We are a party to intellectual property license agreements with third parties. For example, we have a non-exclusive, royalty bearing license with Teva Pharmaceuticals International GmbH, or Teva GmbH, for its CGRP patent portfolio to develop, manufacture and commercialize eptinezumab in the United States and worldwide, excluding Japan and Korea. We also have a third-party royalty free license associated with the Keck Graduate Institute for our yeast-based proprietary manufacturing technology. We may enter into additional license agreements in the future. Our existing license agreements impose, and we expect that our future license agreements will impose, various diligence, royalty payment, milestone payment, insurance and other obligations on us. If we fail to comply with these obligations or our other obligations in our license agreements, our licensors may have the right to terminate these agreements, in which event we may not be able to develop and market any product or use any platform technology that is covered by these agreements. Termination of these licenses or reduction or elimination of our licensed rights may result in our having to negotiate new or reinstated licenses with less favorable terms or our not having sufficient intellectual property rights to operate our business. The occurrence of such events could materially harm our business.

Our ability to successfully commercialize our products may be impaired if we are unable to obtain and maintain effective intellectual property rights for our proprietary antibody platform and product candidates.

Our success depends in large part on our and our licensors' ability to obtain and maintain patent and other intellectual property protection in the United States and in other countries with respect to our proprietary antibody platform and products. In some circumstances, we may not have the right to control the preparation, filing and prosecution of patent applications, or to maintain the patents or enforce the patents, covering technology or products that we license from third parties. Therefore, we cannot be certain that these patents and applications will be prosecuted and enforced in a manner consistent with the best interests of our business. In addition, if third parties who license patents to us fail to maintain such patents, or lose rights to those patents, the rights we have licensed may be reduced or eliminated.

Because certain intellectual property rights are shared between us and any of our future collaborators, it is possible that disputes may arise related to the distribution of those rights.

We have sought to protect our proprietary position by filing patent applications in the United States and abroad related to our novel technologies and products that are important to our business. This process is expensive and time-consuming, and we may not be able to file and prosecute all necessary or desirable patent applications at a reasonable cost or in a timely manner. It is also possible that we will fail to identify patentable aspects of our research and development output before it is too late to obtain patent protection. The standards that the United States Patent and Trademark Office, or USPTO, uses to grant patents are not always applied predictably or uniformly and can change. Consequently, we cannot be certain as to whether pending patent applications will be allowed; and if allowed, we cannot be certain as to the type and extent of patent claims that will be issued to us in the future. Our existing patents and any future patents we obtain may not be sufficiently broad to prevent others from using our technologies or from developing competing products and technologies.

The patent position of biotechnology and pharmaceutical companies generally is highly uncertain and involves complex legal and factual questions for which legal principles remain unresolved. In recent years, patent rights have been the subject of significant

litigation. As a result, the issuance, scope, validity, enforceability and commercial value of our and our licensors' patent rights are highly uncertain. Our and our licensors' pending and future patent applications may not result in patents being issued which protect our technology or products or which effectively prevent others from commercializing competitive technologies and products. Changes in either the patent laws or interpretation of the patent laws in the United States and other countries may diminish the value of our patents or narrow the scope of our patent protection. The laws of foreign countries may not protect our rights to the same extent as the laws of the United States. Publications of discoveries in the scientific literature often lag behind the actual discoveries, and patent applications in the United States and other jurisdictions are typically not published until 18 months after filing, or in some cases not at all. Therefore, we cannot be certain that we or our licensors were the first to make the inventions claimed in our owned and licensed patents or pending patent applications, or that we or our licensors were the first to file for patent protection of such inventions.

In March 2013, the United States converted to a first-to-file patent system under the recently enacted America Invents Act. With this change, the United States patent system was brought into closer conformity with the patent systems of other countries, the vast majority of which operate as first-to-file patent systems. Under the former system, and assuming the other requirements for patentability were met, the first to invent was entitled to the patent. A number of our patents and patent applications are subject to the first-to-invent system because they originated prior to the March 2013 cutoff. Under the new United States system, and outside the United States, the first to file a patent application is entitled to the patent, with certain exceptions. A number of our patents and patent applications are subject to the new first-to-file system in the United States because they originated after the March 2013 cutoff. The full effect of these changes remains unclear as the USPTO endeavors to implement various regulations concerning the new system. Furthermore, the courts have yet to address the vast majority of these provisions and the applicability of the America Invents Act and new regulations on specific patents discussed herein have not been determined and would need to be reviewed. We may become involved in opposition, interference, post-grant or derivation proceedings challenging our patent rights or the patent rights of others, and the outcome of any proceedings are highly uncertain. An adverse determination in any such proceeding could reduce the scope of, or invalidate, our patent rights, allow third parties to commercialize our technology or products and compete directly with us, without payment to us, or result in our inability to manufacture or commercialize products without infringing third-party patent rights. Even if our owned and licensed patent applications issue as patents, they may not issue in a form that will provide us with any meaningful protection, prevent competitors from competing with us or otherwise provide us with any competitive advantage. Our competitors may be able to circumvent our owned or licensed patents by developing similar or alternative technologies or products in a non-infringing manner. The issuance of a patent is not conclusive as to its scope, validity or enforceability, and our owned and licensed patents may be challenged in the courts or patent offices in the United States and abroad. Such challenges may result in patent claims being narrowed, invalidated or held unenforceable, which could limit our ability to stop or prevent us from stopping others from using or commercializing similar or identical technology and products, or limit the duration of the patent protection of our technology and products. Given the amount of time required for the development, testing and regulatory review of future product candidates, patents protecting such candidates might expire before or shortly after such candidates are commercialized. As a result, our owned and licensed patent portfolio may not provide us with sufficient rights to exclude others from commercializing products similar or identical to ours or otherwise provide us with a competitive advantage.

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

Competitors may infringe our patents. To counter infringement or unauthorized use, we may be required to file infringement claims, which can be expensive and time-consuming. In addition, in an infringement proceeding, a court may decide that a patent of ours is invalid or unenforceable, or may refuse to stop the other party from using the technology at issue on the grounds that our patents do not cover the technology in question. The standards that courts use to interpret patents are not always applied predictably or uniformly and can change, particularly as new

technologies develop. As a result, we cannot predict with certainty how much protection, if any, will be given to our patents if we attempt to enforce them and they are challenged in court. An adverse result in any litigation proceeding could put one or more of our patents at risk of being invalidated or interpreted narrowly. Inequitable conduct is frequently raised as a defense during intellectual property litigation. It is believed that all parties involved in the prosecution of our patent applications have complied with their duties of disclosure in the course of prosecuting our patent applications, however, it is possible that legal claims to the contrary could be asserted if we were engaged in intellectual property litigation, and the results of any such legal claims are uncertain due to the inherent uncertainty of litigation. If a court determines that any party involved in the prosecution of our patents failed to comply with their duty of disclosure, the subject patent would be unenforceable. Furthermore, because of the substantial amount of discovery required in connection with intellectual property litigation, there is a risk that some of our confidential information could be compromised by disclosure during this type of litigation.

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.

Third parties may assert infringement claims against us, or other parties we have agreed to indemnify, based on existing patents or patents that may be granted in the future. Furthermore, since patent applications are published some time after filing, and because

applications can take several years to issue, there may be pending third-party patent applications that are unknown to us, which may later result in issued patents.

We may initiate litigation or other legal proceedings with respect to patents held by others. Because of the inevitable uncertainty in intellectual property legal proceedings, any such proceedings, if initiated, may not ultimately be resolved in our favor regardless of our perception of the merits. If we lose such a proceeding, or are found to infringe a third party's intellectual property rights in any jurisdiction, we may not be to engage in commercialization and related activities for a product candidate for its intended use in such jurisdiction without obtaining a license from such third party. However, we may not be able to obtain any required license on commercially reasonable terms or at all. Even if we are able to obtain a license, it may be non-exclusive, thereby giving our competitors access to the same technologies licensed to us. We could be forced, including by court order, to cease commercializing the infringing technology or product. In addition, in any such proceeding or litigation, we could be found liable for monetary damages, including in the United States treble damages if we are found to have willfully infringed a patent, and attorneys' fees. A finding of infringement could prevent us from commercializing our product candidates or force us to cease some of our business operations.

In July 2014, we and Eli Lilly each filed an opposition to a European patent owned by Teva GmbH with claims directed to CGRP antagonist antibodies and use of such CGRP antagonist antibodies in human therapy for the prevention or treatment of headache such as migraine. In January 2018, we entered into a European patent settlement and global license agreement with Teva GmbH pursuant to which we received a non-exclusive license to Teva GmbH's CGRP patent portfolio, which includes the opposed European patent, to develop, manufacture and commercialize eptinezumab in the United States and worldwide, excluding Japan and Korea, and agreed to withdraw our opposition.

We may be unable to protect the confidentiality of our trade secrets, thus harming our business and competitive position.

In addition to our patented technology and products, we rely upon trade secrets, including unpatented know-how, technology and other proprietary information to develop and maintain our competitive position, which we seek to protect, in part, by confidentiality agreements with our employees, collaborators and consultants. We also have agreements with our employees and selected consultants that obligate them to assign their inventions to us. However, it is possible that technology relevant to our business will be independently developed by a person that is not a party to such an agreement. Furthermore, if the employees, consultants or collaborators that are parties to these agreements breach or violate the terms of these agreements, we may not have adequate remedies for any such breach or violation, and we could lose our trade secrets through such breaches or violations. Furthermore, our trade secrets could be disclosed, misappropriated or otherwise become known or be independently discovered by our competitors. Our trade secrets can be lost through their inadvertent or advertent disclosure to others. In addition, intellectual property laws in foreign countries may not protect our intellectual property to the same extent as the laws of the United States. If our trade secrets are disclosed or misappropriated, it would harm our ability to protect our rights and harm our business.

We may be subject to claims that our employees have wrongfully used or disclosed intellectual property of their former employers. Intellectual property litigation or proceedings could cause us to spend substantial resources and distract our personnel from their normal responsibilities.

Many of our employees were previously employed at universities or other biotechnology or pharmaceutical companies, including our competitors or potential competitors. 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, including trade secrets or other proprietary information, of any such employee's former employer. Litigation may be necessary to defend against these claims. If we fail in defending any such claims, in addition to paying monetary damages, we may lose valuable intellectual property rights or personnel. Even if we are successful in defending against such claims, litigation or other legal proceedings relating to intellectual property claims may cause us to incur significant expenses, and could distract our technical and management personnel from their normal responsibilities. In addition, there could be public announcements of the results of hearings, motions or other interim proceedings or developments and if securities analysts or investors perceive these results to be negative, it could have a substantial adverse effect on the price of our common stock. Such litigation or proceedings could substantially increase our operating losses and reduce our resources available for development activities. We may not have sufficient financial or other resources to adequately conduct such litigation or proceedings. Some of our competitors may be able to sustain the costs of such litigation or proceedings more effectively than we can because of their substantially greater financial resources. Uncertainties resulting from the initiation and continuation of patent litigation or other intellectual property related proceedings could impair our ability to compete in the marketplace.

Risks Related to Our Operations and Personnel

Our future success depends on our ability to retain our executive officers and other key employees and to attract, retain and motivate qualified personnel.

We are highly dependent on our executive officers and other key employees. The employment of our executive officers and other key employees is typically at-will and our executive officers and other key employees may terminate their employment with us at any time. The loss of the services of any of our executive officers or other key employees could impede the achievement of our research, development and commercialization objectives.

Recruiting and retaining other qualified scientific, clinical, manufacturing and sales and marketing personnel is critical to our success. We may not be able to attract and retain critical personnel on acceptable terms given the competition among numerous pharmaceutical and biotechnology companies for similar personnel. We also experience competition for the hiring of scientific and clinical personnel from universities and research institutions. In addition, we rely on consultants and advisors, including scientific and clinical advisors, to assist us in formulating our research and development and commercialization strategy. Our consultants and advisors may be employed by third parties and have commitments under consulting or advisory contracts with other entities that may limit their availability to us.

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

Over the next several years, if any of our product candidates receive marketing approval, we expect to experience significant growth in the number of our employees and the scope of our operations, particularly in the areas of drug development, regulatory affairs, sales and marketing and other functional areas, including finance, accounting and legal. For example, if eptinezumab is approved, we plan to build a specialty sales force targeting high-prescribing neurologists and headache centers in the United States. To manage our anticipated future growth, we must continue to implement and improve our managerial, operational and financial systems, expand our facilities and continue to recruit and train additional qualified personnel. Due to our limited financial resources and the limited experience of our management team in managing a company with such anticipated growth, we may not be able to effectively manage the expansion of our operations or recruit and train additional qualified personnel. The physical expansion of our operations may lead to significant costs and may divert our management and business development resources. Any inability to manage growth could delay the execution of our business plans or disrupt our operations.

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 harm 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 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 materials.

In addition, we may be required to incur substantial costs to comply with current or future environmental, health and safety laws and regulations. These current or future laws and regulations may divert resources away from our research, development or production efforts. Failure to comply with these laws and regulations also may result in substantial fines, penalties or other sanctions.

Business disruptions could harm our future revenues and financial condition and increase our costs and expenses.

Our operations could be subject to earthquakes, power shortages, telecommunications failures, floods, hurricanes, fires, extreme weather conditions, medical epidemics and other natural or manmade disasters or business interruptions. The occurrence of any of these business disruptions could harm our operations and financial condition and increase our costs and expenses. Our corporate headquarters is located in Washington and certain clinical sites for our product candidates, operations of our existing and future

partners and suppliers are or will be located in Washington near major earthquake faults. The ultimate impact on us, our significant partners, suppliers and our general infrastructure of being located near major earthquake faults and being consolidated in certain geographical areas is unknown, but our operations and financial condition could suffer in the event of a major earthquake or other natural or manmade disaster.

Our internal computer systems, or those of our CROs or other contractors or consultants, may fail or suffer security breaches, which could result in a material disruption of our drug development programs.

Despite the implementation of security measures, our internal computer systems and those of our CROs and other contractors and consultants are vulnerable to damage from computer viruses, unauthorized access, natural disasters, terrorism, war and telecommunication and electrical failures. While we have not experienced any such system failure, accident or security breach to date, if such an event were to occur and cause interruptions in our operations, it could result in a material disruption of our drug development programs. For example, the loss of clinical trial data from completed or ongoing clinical trials for any of our product candidates could result in delays in our regulatory approval efforts and significantly increase our costs to recover or reproduce the data. To the extent that any disruption or security breach 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 of our product candidates could be delayed.

Risks Related to Ownership of Our Securities

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 have fluctuated in the past and may fluctuate significantly in the future, which makes it difficult for us to predict our future operating results. From time to time, we may enter into collaboration agreements with other companies that include development funding and significant upfront and milestone payments, and amounts earned from collaboration agreements may be an important source of our revenues. Accordingly, our revenues, if any, will depend on development funding and the achievement of development and clinical milestones under any of our future collaboration arrangements, as well as any potential future license 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.

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 product candidates, which may change from time to time;

- the cost of manufacturing our product candidates, which may vary depending on the quantity of production and the terms of our agreements with manufacturers;

- expenditures that we will or may incur to acquire or develop additional product candidates and technologies;

- the level of demand for our product candidates, should they receive approval, which may vary significantly;

- future accounting pronouncements or changes in our accounting policies;

- the timing and success or failure of clinical trials for our product candidates or competing product candidates, or any other change in the competitive landscape of our industry, including consolidation among our competitors or partners; and

- the risk/benefit profile, cost and reimbursement policies with respect to our products candidates, if approved, and existing and potential future drugs that compete with our product candidates.

The cumulative effects of these factors could result in large fluctuations and unpredictability in our quarterly and annual operating results. As a result, comparing our operating results on a period-to-period basis may not be meaningful. Investors should not rely on our past results as an indication of our future performance. This variability and unpredictability could also result in our failing to meet the expectations of industry or financial analysts or investors for any period. If our 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 operating results guidance we may provide.

Our stock price may be volatile, and purchasers of our common stock could incur substantial losses. Volatility in the market price and trading volume of our common stock could adversely impact the trading price of the Notes.

Our stock price has fluctuated in the past and is likely to be volatile in the future. Since January 1, 2015, the reported sale price of our common stock has fluctuated between $8.60 and $54.90 per share. For example, on June 26, 2017 prior to our announcement of our PROMISE 1 data, the closing price of our common stock was $18.70 per share. Following the announcement of our PROMISE 1 data, the closing price of our common stock on June 27, 2017 was $13.48, and since that date the reported sale price of our common stock has been as low as $8.60 per share.

The stock market in general and the market for biotechnology companies in particular have experienced extreme volatility that has often been unrelated to the operating performance of particular companies. As a result of this volatility, investors may experience losses on their investment in our common stock. The market price for our common stock may be influenced by many factors, including the following:

- the success of competitive products or technologies;
- results of clinical trials of our product candidates or those of our competitors;
- regulatory or legal developments in the United States and other countries, especially changes in laws or regulations applicable to our product candidates;
- introductions and announcements of future product candidates by us, any of our future collaborators, or our competitors, and the timing of these introductions or announcements;
- actions taken by regulatory agencies with respect to our product candidates, clinical trials, manufacturing process or sales and marketing terms;
- variations in our financial results or those of companies that are perceived to be similar to us;
- the success of our efforts to discover, acquire or in-license additional products or product candidates;
- developments concerning our future collaborations, including but not limited to those with our sources of manufacturing supply and our future collaborators;
- manufacturing disruptions;

- announcements by us or our competitors of significant acquisitions, strategic partnerships, joint ventures or capital commitments;

- developments or disputes concerning patents or other proprietary rights, including litigation matters and our ability to obtain patent protection for our product candidates;

- our ability or inability to raise additional capital and the terms on which we raise it;

- the recruitment or departure of key personnel;

- changes in the structure of healthcare payment systems;

- market conditions in the pharmaceutical and biotechnology sectors;

- actual or anticipated changes in earnings estimates or changes in stock market analyst recommendations regarding our common stock, other comparable companies or our industry generally;

- trading volume of our common stock;

- sales of our common stock by us or our stockholders;

- changes in our board of directors or key personnel;

- the expiration of contractual lock-up agreements;

- changes in our capital structure, such as future issuances of debt or equity securities;

- short sales, hedging and other derivative transactions involving our capital stock;

- general economic, industry and market conditions in the United States and abroad, including, for example, the impact of Brexit or similar events on global financial markets;

- other events or factors, including those resulting from war, incidents of terrorism or responses to these events; and

- the other risks described in this "Risk Factors" section.

These broad market and industry factors may seriously harm the market price of our common stock, regardless of our operating performance. In the past, following periods of volatility in the market, securities class-action litigation has often been instituted against companies. Such litigation, if instituted against us, could result in substantial costs and diversion of management's attention and resources, which could harm our business.

A decrease in the market price of our common stock would likely adversely impact the trading price of the Notes. The market price of our common stock could also be affected by possible sales of our common stock by investors who view the Notes as a more attractive means of equity participation in us and by hedging or arbitrage trading activity that we expect to develop involving our common stock. This trading activity could, in turn, affect the trading price of the Notes.

Substantial future sales of shares of our common stock could cause the market price of our common stock and the trading price of the Notes to decline. This could cause the market price of our common stock and trading price of the Notes to drop significantly, even if our business is doing well.

Sales of a substantial number of shares of our common stock into the public market could occur at any time. We may issue shares of our common stock or equity securities senior to our common stock in the future for a number of reasons, including to finance our operations and business strategy, to adjust our ratio of debt-to-equity, to satisfy our obligations upon the exercise of options, or for other reasons. These sales, or the perception in the market that the holders of a large number of shares intend to sell shares, could reduce the market price of our common stock, could impair our ability to raise capital through the sale of additional equity securities and could adversely affect the trading price of the Notes. We are unable to predict the effect that such sales may have on the prevailing market price of our common stock or trading price of the Notes.

A substantial number of shares of our common stock is reserved for issuance upon conversion of shares of our Class A-1 Convertible Preferred Stock and the Notes. In addition, as of December 31, 2017, we had options outstanding

that, if fully exercised, would result in the issuance of 7,286,834 shares of common stock. As of December 31, 2017, there were also 1,504,604 shares of common stock reserved for future issuance under our 2014 Equity Incentive Plan and 1,183,862 shares of common stock reserved for issuance under our 2014 Employee Stock Purchase Plan. The authorized number of shares under both such benefit plans are subject to automatic annual increases in the number of shares of common stock reserved for future issuance on January 1 of each year through 2024. All of the shares of common stock issuable pursuant to our equity compensation plans have been registered for public resale under the Securities Act of 1933, as amended, or the Securities Act. Accordingly, these shares will be able to be freely sold in the public market upon issuance as permitted by any applicable vesting requirements and the restrictions of Rule 144 under the Securities Act in the case of our affiliates.

The existence of the Notes may encourage short selling by market participants because the conversion of the Notes could be used to satisfy short positions, or anticipated conversion of the Notes into shares of our common stock could depress the price of our common stock.

Moreover, as of December 31, 2017, holders of an aggregate of up to approximately 3.7 million shares of our common stock have rights, subject to some conditions, to require us to file registration statements covering their shares or to include their shares in registration statements that we may file for ourselves or other stockholders.

In addition, in connection with our January 2018 issuance of non-voting Class A-1 Convertible Preferred Stock to certain institutional and other accredited investors affiliated with or managed by Redmile Group, LLC, collectively, Redmile, we entered into a registration rights agreement with Redmile. Under the registration rights agreement, we filed a prospectus supplement under our current registration statement on Form S-3 (SEC File No. 333-216199), and are required to file, if needed, one or more additional registration statements, as permissible and necessary, for the resale of the shares of our common stock issued or issuable upon conversion of the Class A-1 Convertible Preferred Stock and a warrant to purchase an aggregate of 75,000 shares of Class A-1 Convertible Preferred Stock that we may be required to issue to Redmile.

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

The trading market for our common stock depends, in part, on the research and reports that securities or industry analysts publish about us or our business. We do not have any control over these analysts. If one or more of the analysts who cover us downgrade our stock or publish inaccurate or unfavorable research about our business, our stock price would likely decline. In addition, if our operating results fail to meet the forecast of analysts, our stock price would likely decline. If one or more of these analysts cease coverage of our company or fail to publish reports on us regularly, demand for our stock could decrease, which might cause our stock price and trading volume to decline.

Complying with the laws and regulations affecting public companies has increased and will increase our costs and the demands on management and could harm our operating results.

As a public company, we are incurring significant legal, accounting and other expenses that we did not incur as a private company. In addition, the Sarbanes-Oxley Act of 2002, or the Sarbanes-Oxley Act, and rules subsequently implemented by the SEC and Nasdaq impose numerous requirements on public companies, including requiring changes in corporate governance practices. Also, the Exchange Act requires, among other things, that we file annual, quarterly and current reports with respect to our business and operating results. Our management and other personnel need to devote a substantial amount of time to compliance with these laws and regulations. These burdens may increase as new legislation is passed and implemented, including any new requirements that the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010 may impose on public companies. These requirements have increased and will continue to increase our legal, accounting, and financial compliance costs and have made and will continue to make some activities more time consuming and costly. We expect these rules and regulations may make it difficult and expensive for us to obtain director and officer liability insurance, and in the future, we may be required to accept reduced policy limits and coverage or to incur substantial costs to maintain the same or similar coverage. These rules and regulations could also make it more difficult for us to attract and retain qualified persons to serve on our board of directors or our board committees or as executive officers.

The Sarbanes-Oxley Act requires, among other things, that we assess the effectiveness of our internal control over financial reporting annually and the effectiveness of our disclosure controls and procedures quarterly. Section 404 of the Sarbanes-Oxley Act, or Section 404, requires us to perform system and process evaluation and testing of our internal control over financial reporting to allow management to report on, and our independent registered public accounting firm potentially to attest to, the effectiveness of our internal control over financial reporting. Our compliance with applicable provisions of Section 404 subjects us to substantial accounting expense and to expend significant management time on compliance-related issues. If we are not able to comply with the requirements of Section 404 applicable to us in a timely manner, or if we or our independent registered public accounting firm identifies deficiencies in our internal control over financial reporting that are deemed to be material weaknesses, the market price of our stock could decline and we could be subject to sanctions or investigations by the SEC or other regulatory authorities, which would require additional financial and management resources.

Furthermore, investor perceptions of our company may suffer if deficiencies are found, and this could cause a decline in the market price of our stock. Irrespective of compliance with Section 404, any failure of our internal control over financial reporting could have a material adverse effect on our stated operating results and harm our reputation. If we are unable to implement these requirements effectively or efficiently, it could harm our operations, financial reporting, or financial results and could result in an adverse opinion on our internal control over financial reporting from our independent registered public accounting firm.

Provisions in our corporate charter documents could make an acquisition of us more difficult and may prevent attempts by our stockholders to replace or remove our current management.

Provisions in our corporate charter and our bylaws may discourage, delay or prevent a merger, acquisition or other change in control of us that stockholders may consider favorable, including transactions in which stockholders might otherwise receive a premium for their shares. These provisions could also limit the price that investors might be willing to pay in the future for shares of our common stock, thereby depressing the market price of our common stock. 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. Because our board of directors is responsible for appointing the members of our management team, these provisions could in turn affect any attempt by our stockholders to replace current members of our management team. Among others, these provisions include the following:

- our board of directors is divided into three classes with staggered three-year terms which may delay or prevent a change of our management or a change in control;

- our board of directors has the right to elect directors to fill a vacancy created by the expansion of the board of directors or the resignation, death or removal of a director, which prevents stockholders from being able to fill vacancies on our board of directors;

- our stockholders may not act by written consent or call special stockholders' meetings; as a result, a holder, or holders, controlling a majority of our capital stock would not be able to take certain actions other than at annual stockholders' meetings or special stockholders' meetings called by the board of directors, the chairman of the board or the chief executive officer;

- our certificate of incorporation does not provide for cumulative voting in the election of directors, which limits the ability of minority stockholders to elect director candidates;

- stockholders must provide advance notice and additional disclosures in order to nominate individuals for election to the board of directors or to propose matters that can be acted upon at a stockholders' meeting, which may discourage or deter a potential acquiror from conducting a solicitation of proxies to elect the acquiror's own slate of directors or otherwise attempting to obtain control of our company; and

- our board of directors may issue, without stockholder approval, shares of undesignated preferred stock; the ability to issue undesignated preferred stock makes it possible for our board of directors to issue preferred stock with voting or other rights or preferences that could impede the success of any attempt to acquire us.

The fundamental change repurchase feature of the Notes may delay or prevent an otherwise beneficial attempt to take over our company.

The terms of the Notes require us to repurchase the Notes in the event of a fundamental change. A takeover of our company would trigger an option of the holders of the notes to require us to repurchase the Notes. This may have the effect of delaying or preventing a takeover of our company that would otherwise be beneficial to our investors.

Provisions under Delaware law and Washington law could make an acquisition of our company more difficult, limit attempts by our stockholders to replace or remove our current management and limit the market price of our common stock.

In addition to provisions in our corporate charter and our bylaws, because we are incorporated in Delaware, we are governed by the provisions of Section 203 of the Delaware General Corporation Law, which generally prohibits a Delaware corporation from engaging in any of a broad range of business combinations with any holder of at least 15% of our capital stock for a period of three years following the date on which the stockholder became a 15% stockholder.

Likewise, because our principal executive offices are located in Washington, the anti-takeover provisions of the Washington Business Corporation Act may apply to us under certain circumstances now or in the future. These provisions prohibit a “target corporation” from engaging in any of a broad range of business combinations with any stockholder constituting an “acquiring person” for a period of five years following the date on which the stockholder became an “acquiring person.”

Item 1B. Unresolved Staff Comments

None.

Item 2. Properties

Our corporate headquarters are located in Bothell, Washington, where we lease approximately 85,000 square feet of office and laboratory space pursuant to lease agreements which expire in July 2023. These facilities house our research, clinical, regulatory, commercial and administrative personnel. We believe that our existing facilities are adequate for our near-term needs. We believe that suitable additional or alternative space would be available if required in the future on commercially reasonable terms.

Item 3. Legal Proceedings

In July 2014, we and Eli Lilly and company each filed an opposition to Labrys Biologics Inc.'s (now owned by Teva Pharmaceuticals International GmbH, or Teva GmbH) European Patent No. 1957106 B1, requesting that such patent be revoked in its entirety. In an oral proceeding held in Munich, Germany on November 18, 2016, the Opposition Division, or OD, of the European Patent Office, or EPO, issued a ruling revoking all claims in the patent directed to CGRP antagonist antibodies and maintaining but narrowing claims relating to the use of such CGRP antagonist antibodies in human therapy to the prevention or treatment of headache such as migraine and cluster headache. The written decision consistent with the oral ruling was issued in February 2017. We subsequently initiated an appeal of the decision. On January 5, 2018, we entered into a European patent settlement and global license agreement with Teva GmbH pursuant to which we received a non-exclusive license to Teva GmbH's CGRP patent portfolio, which includes the opposed European patent, to develop, manufacture and commercialize eptinezumab in the United States and worldwide, excluding Japan and Korea, and agreed to withdraw our appeal. While the agreement does not provide us with a license for Japan and Korea, we believe we have freedom to develop, manufacture and commercialize eptinezumab in these countries.

In addition, from time to time, we may become involved in other legal proceedings relating to claims arising from the ordinary course of business. Our management believes that there are currently no claims or actions pending against us, the ultimate disposition of which could have a material adverse effect on our results of operations, financial condition or cash flows.

Item 4. Mine Safety Disclosures

Not applicable.

PART II

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

Our common stock is traded on The NASDAQ Global Market under the symbol "ALDR." Trading of our common stock commenced on May 8, 2014 in connection with our initial public offering, or IPO. The following table sets forth, for the periods indicated, the high and low sales prices for our common stock as reported on The NASDAQ Global Market.

Year ended December 31, 2016	High	Low
First quarter	$32.96	$15.82
Second quarter	$32.44	$22.38
Third quarter	$36.48	$24.39
Fourth quarter	$34.30	$20.30
Year ended December 31, 2017		
First quarter	$25.45	$18.55
Second quarter	$22.50	$11.15
Third quarter	$12.80	$8.60
Fourth quarter	$13.25	$9.55

Holders

As of February 21, 2018, there were 20 holders of record of our common stock. The actual number of stockholders is greater than this number of record holders and includes stockholders who are beneficial owners but whose shares are held in street name by brokers and other nominees.

Dividends

We have never declared or paid, and do not anticipate declaring, or paying in the foreseeable future, any cash dividends on our capital stock. Future determinations as to the declaration and payment of dividends, if any, will be at the discretion of our board of directors and will depend on then existing conditions, including our operating results, financial conditions, contractual restrictions, capital requirements, business prospects and other factors our board of directors may deem relevant.

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Performance Graph

The following graph compares the performance of our common stock for the periods indicated with the performance of the NASDAQ Composite Index and the NASDAQ Biotechnology Index. This graph assumes an investment of $100 on May 8, 2014 in each of our common stock, the NASDAQ Composite Index and the NASDAQ Biotechnology Index, and assumes reinvestment of dividends, if any. The stock price performance shown on the graph below is not necessarily indicative of future stock price performance.

This information under “Stock Performance Graph” is not deemed filed with the Securities and Exchange Commission and is not to be incorporated by reference in any filing of Alder BioPharmaceuticals, Inc. under the Securities Act of 1933, as amended, or the Securities Exchange Act of 1934, as amended, whether made before or after the date of this Annual Report on Form 10-K and irrespective of any general incorporation language in those filings.

Item 6. Selected Consolidated Financial Data

The following selected consolidated financial data is derived from our audited financial statements and should be read in conjunction with, and is qualified in its entirety by, Item 7, “Management’s Discussion and Analysis of Financial Condition and Results of Operations,” and Item 8, “Financial Statements and Supplementary Data” contained elsewhere in this Annual Report on Form 10-K. The selected consolidated statements of operations data for the years ended December 31, 2017, 2016 and 2015 and consolidated balance sheet data as of December 31, 2017 and 2016 have been derived from our audited consolidated financial statements appearing elsewhere in this Annual Report on Form 10-K. The selected consolidated statements of operations data for the year ended December 31, 2014 and 2013 and consolidated balance sheet data as of December 31, 2015, 2014 and 2013 were derived from our audited financial statements that are not included in this Annual Report on Form 10-K.

	Years Ended December 31,				
	2017	2016	2015	2014	2013
Consolidated statement of operations data: [1]	(in thousands, except share and per share data)				
Revenues					
Collaboration and license agreements	$1,619	$113	$—	$54,705	$18,796
Operating expenses					
Cost of sales	1,619	113	—	—	—
Research and development	252,902	132,760	69,611	33,439	31,883
General and administrative	38,102	26,148	16,718	12,462	7,674
Total operating expenses	292,623	159,021	86,329	45,901	39,557
Gain on license of clazakizumab	—	1,050	—	—	—
Income (loss) from operations	(291,004)	(157,858)	(86,329)	8,804	(20,761)
Other income (expense)					
Interest income	2,495	1,966	702	44	54
Foreign currency gain (loss)	223	(349)	73	15	(21)
Other income	50	172	84	45	158
Other expense	—	—	—	—	(43)
Total other income, net	2,768	1,789	859	104	148
Net income (loss) before equity in net loss of unconsolidated entity	(288,236)	(156,069)	(85,470)	8,908	(20,613)
Equity in net loss of unconsolidated entity	(643)	(185)	—	—	—
Net income (loss)	$(288,879)	$(156,254)	$(85,470)	$8,908	$(20,613)
Net income (loss) per share - basic	$(4.95)	$(3.23)	$(2.11)	$0.43	$(21.14)
Net income (loss) per share - diluted	$(4.95)	$(3.23)	$(2.11)	$0.30	$(21.14)
Weighted average number of common shares used in net income (loss) per share - basic	58,347,284	48,407,565	40,586,980	20,506,565	975,158
Weighted average number of common shares used in net income (loss) per share - diluted	58,347,284	48,407,565	40,586,980	29,427,287	975,158

[1] In December 2014, Bristol-Myers Squibb, or BMS, terminated their collaboration agreement regarding clazakizumab with us. As a result of the termination of the agreement, the estimated development period was adjusted and we recognized revenue related to the BMS agreement in the amount of $54.5 million in 2014. The acceleration of revenue recognition resulted in us reporting net income for 2014.

	As of December 31,				
	2017	2016	2015	2014	2013
Consolidated balance sheet data: [2]	(in thousands)				
Cash, cash equivalents, investments, and restricted cash	$286,240	$351,867	$381,012	$55,872	$23,227
Working capital	263,888	367,293	309,829	55,734	2,457
Total assets	303,136	409,154	400,027	64,359	26,739
Total liabilities	23,861	26,371	12,510	5,202	58,727
Convertible preferred stock	—	—	—	—	111,374
Common stock and additional paid in capital	946,876	761,461	610,394	196,085	2,443
Accumulated deficit	(667,509)	(378,630)	(222,376)	(136,906)	(145,814)
Total stockholders' equity (deficit)	279,275	382,783	387,517	59,157	(143,362)

[2] The 2017 consolidated balance sheet data reflect $161.5 million in net proceeds received from an underwritten public offering of our common stock that was completed in July 2017. The 2016 consolidated balance sheet data reflect $134.9 million in net proceeds received from an underwritten public offering of our common stock that was completed in April 2016. The 2015 consolidated balance sheet data reflect $406.6 million in net proceeds received

from two underwritten public offerings of our common stock that were completed in January and June 2015.

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

You should read the following discussion and analysis together with the financial statements and the related notes to those statements included elsewhere in this report. This discussion contains forward-looking statements that involve risks and uncertainties. As a result of many factors, such as those set forth in the section of this report captioned "Risk Factors" and elsewhere in this report, our actual results may differ materially from those anticipated in these forward-looking statements.

Overview

We are a clinical-stage biopharmaceutical company that discovers, develops and seeks to commercialize therapeutic antibodies with the potential to meaningfully transform the treatment paradigm in migraine. All of our product candidates were discovered and developed by Alder scientists using our proprietary antibody technology platform coupled with a deliberate approach to design and select candidates with properties that we believe optimize the therapeutic potential for patients and commercial competitiveness.

We are focusing our resources and development efforts principally on eptinezumab (ALD403), our most advanced solely-owned product candidate, in order to maximize its therapeutic and commercial potential. Eptinezumab is being evaluated in a pivotal trial program for the prevention of migraine, with a Biologics License Application (BLA) submission to the U.S. Food and Drug Administration (FDA) planned for the second half of 2018. Migraine is a serious neurological disease affecting about 36 million people in the United States. Of that number, approximately 13 million people in the United States are candidates for a migraine prevention therapeutic. Of these candidates for migraine prevention, we estimate that there are between five million to seven million people living with episodic and chronic migraine who are the most highly impacted patients, and they typically experience eight or more migraine days per month. Current preventative migraine treatment options, available in the market today, are challenged by safety, efficacy and tolerability limitations. Epidemiologic studies suggest that approximately 38% of migraineurs would benefit from preventive therapies, but only 11% currently receive them. As a result, we believe there is a significant, unmet need for new treatment and prevention options. We plan to focus our initial commercialization efforts for eptinezumab on the approximately 3,000 headache specialists that see the largest number of these highly impacted patients. We estimate this U.S. market opportunity for eptinezumab is approximately $1.5 to $2.0 billion.

Eptinezumab is a genetically engineered monoclonal antibody inhibiting calcitonin gene-related peptide (CGRP), a small protein and a validated target that is understood to drive migraine initiation, maintenance and chronification. Designed to deliver a competitively differentiated approach to migraine prevention, we believe eptinezumab holds the potential to be a transformative therapeutic and meet a profound medical need, changing the migraine prevention treatment paradigm for physicians and patients living with migraine.

Our deliberate approach to engineering and developing eptinezumab is designed to provide a unique clinical profile that, after a single administration via an infusion procedure, provides rapid, effective and sustained migraine prevention. We believe that this clinical profile, as supported by data from our clinical trials, will present a potentially compelling value proposition for patients, physicians, payors and our stakeholders.

Eptinezumab is the only potent and selective anti-CGRP monoclonal antibody in clinical development delivered by infusion. We believe the infusion mode of administration provides the following key benefits:

- High specificity and strong binding for rapid and sustained suppression of CGRP biology;
- Allows for the total dose to be immediately active to inhibit CGRP with 100% bioavailability; and
- Supervised medication administration has the potential to promote patient adherence while maximizing product control and consistency of delivery.

In our first Phase 3 pivotal trial, PRevention Of Migraine via Intravenous ALD403 Safety and Efficacy 1 (PROMISE 1) for the prevention of frequent episodic migraine, and our second Phase 3 pivotal trial, PRevention Of Migraine via Intravenous ALD403 Safety and Efficacy 2 (PROMISE 2) for the prevention of chronic migraine, eptinezumab has demonstrated:

1. Rapid: Suppression of migraine risk is achieved on the first day post infusion:
- On Day 1 post infusion, the risk of having a migraine was reduced by >50% versus baseline following a single administration
2. Effective: Significant days of migraine freedom attained within 1 month following a single administration
- Approximately 1 in 3 patients had a ≥75% reduction in migraine days within 1 month
- More than half of patients had a ≥50% reduction in migraine days within 1 month
3. Sustained: Migraine free days sustained for 3 months following a single administration

a. ≥50% and ≥75% reductions in migraine days sustained through 3 months
b. Average 15-17% of patients had no migraines for months 1 to 3
4. Safety and tolerability profile consistent with earlier eptinezumab studies

We plan to submit a BLA to the FDA for eptinezumab in the second half of 2018. The pivotal trial program, in support of our BLA submission, consists of PROMISE 1, PROMISE 2 and a single open-label Phase 3 clinical trial. PROMISE 1 commenced in October 2015 and is evaluating the safety and efficacy of eptinezumab once every 3 months for one year in 888 patients with frequent episodic migraine, defined as four to 14 migraine days per month. PROMISE 2 commenced in November 2016 and is evaluating the safety and efficacy of eptinezumab once every 3 months for 6 months in 1,072 patients with chronic migraine, defined as 15 or more headache days per month, with diagnostic and therapeutic features of migraine being present on eight or more days per month. The open-label trial commenced in December 2016 and is evaluating the long-term safety and tolerability of eptinezumab once every 3 months for one year in approximately 120 patients with chronic migraine. On June 27, 2017, we announced top-line results from PROMISE 1, showing that eptinezumab met the primary and key secondary endpoints. On January 8, 2018, we announced top-line results from PROMISE 2, showing that eptinezumab met all primary and key secondary endpoints. We have completed enrollment in the open-label trial and expect to announce top-line results in the first half of 2018. We are also focused on executing key chemistry, manufacturing and controls, or CMC, activities supporting our BLA submission, including a pharmacokinetic comparability study to be completed in the second half of 2018 to ensure commercial readiness of supply upon launch.

Based on the strength of eptinezumab's clinical profile, supportive feedback we have received from the physician community and the market potential for eptinezumab delivered via a 30 minute infusion, we have determined the most prudent use of our resources in the near-term is in support of our planned BLA submission. With respect to a subcutaneous route of administration, we believe it is potentially an important way to enhance the value of eptinezumab and will provide an update on our strategy and future plans for this route of administration after we receive confirmation from the FDA that our BLA submission has been accepted for filing.

Assuming eptinezumab administered via infusion is approved by the FDA, we plan to focus our initial commercialization efforts on procedure oriented headache specialists in the United States with a specialty sales force sizing of approximately 75 to 125. We believe that these headache specialists comprise neurologists, pain specialists and primary care physicians and treat the highest proportion of the five million to seven million highly impacted migraine patients described above. We estimate this group of headache specialists to number approximately 3,000 physicians. We believe these physicians have a stronger preference for eptinezumab delivered via infusion versus self-administered anti-CGRP options due to the strength of eptinezumab's clinical profile. These physicians utilize in-office procedures and have previously prescribed infusion therapies. We estimate that 94% of these physicians have previously prescribed an infusion therapy for migraine or other conditions. They administer infusion therapies within practice, hospital, or free-standing infusion centers. They value patient adherence benefits associated with supervised medication administration and they have an infrastructure in place for patient flow, supply and reimbursement.

We are committed to commercializing eptinezumab in the United States as a migraine prevention therapy, and are focused on capturing the full commercial value of eptinezumab globally. We recognize the potential for strategic partnerships and/or other arrangements that bring additional capabilities and infrastructure, as well as value to the program. Thus, as a key component of our commercial readiness activities, we are actively reviewing options both globally and in the United States that will allow us to realize the full commercial potential of eptinezumab beyond what we can achieve on our own.

Our product candidate pipeline also includes ALD1910, a preclinical monoclonal antibody that targets pituitary adenylate cyclase-activating polypeptide-38 (PACAP-38). ALD1910 is undergoing investigational new drug (IND)-enabling studies for the prevention of migraine. PACAP-38 is a protein that is active in mediating the initiation

of migraine, and we believe that ALD1910 holds potential as a treatment for migraineurs who have an inadequate response to therapeutics directed at CGRP or its receptor. Our third pipeline candidate is clazakizumab, designed to block the pro-inflammatory cytokine IL-6. In May 2016, we licensed the exclusive worldwide rights for clazakizumab to Vitaeris, Inc., or Vitaeris, based in Vancouver, British Columbia. In connection with the license, we received an equity interest in Vitaeris and are eligible to receive royalties and certain other payments. In November 2017, Vitaeris and its shareholders, including Alder, entered into a strategic collaboration and purchase option agreement (the "option agreement") with a third party, CSL Limited, (CSL), an Australian entity, to expedite the development of clazakizumab as a therapeutic option for solid organ transplant rejection. Pursuant to the option agreement, CSL will provide research funding to Vitaeris for the development of clazakizumab and CSL received an exclusive option to acquire Vitaeris, subject to certain terms and conditions. Upon execution of the option agreement, Vitaeris received an upfront payment of $15 million and Vitaeris will also receive future development milestone payments. If CSL exercises its purchase option, it will be required to make to Vitaeris' shareholders, including Alder, an immediate one-time payment and thereafter certain sales-based milestone payments. We will continue to be eligible to receive royalties and certain other payments following an acquisition of Vitaeris by CSL. Prior to the license to Vitaeris, clazakizumab completed two positive Phase 2b clinical trials establishing proof-of-concept in patients with rheumatoid arthritis.

Corporate and Other Financial Information

We were incorporated in 2002 and have not generated any product revenue. Through December 31, 2017, our operations have been primarily funded by $783.2 million of net proceeds in public offerings, $111.4 million in private placements of our capital stock, and $135.0 million in upfront payments, milestones and research and development payments from our former collaborators and government grants.

In July 2017, we received $161.5 million in net proceeds from an underwritten public offering of common stock. In January 2018, we received approximately $97.7 million in net proceeds from a private placement of convertible preferred stock. In February 2018, we received approximately $277.7 million in net proceeds from an underwritten public offering of 2.5% convertible senior notes due 2025, or the Notes. The purchase agreement for the placement of the convertible preferred stock, and a right we had under such agreement to sell to the investors an additional $150 million of convertible preferred stock, terminated upon the closing of the Notes offering and no additional shares will be issued under such agreement, except in the event of warrants issued and exercised as a result of a deemed liquidation event.

We are focusing our resources and development efforts principally on eptinezumab in order to maximize its therapeutic and commercial potential. We believe that our available cash, cash equivalents, short-term investments and restricted cash as of December 31, 2017, together with the proceeds received from the January 2018 private placement of convertible preferred stock and February 2018 Notes offering, will be sufficient to achieve a U.S. commercial launch of eptinezumab on our expected schedule, assuming regulatory approval, and meet our projected operating requirements into 2020. We have based our estimate on the timing for our projected expenditures on assumptions that may prove to be wrong, and we could utilize our available capital resources sooner than we currently expect. Furthermore, our operating plans may change, and we may need additional funds to meet operational needs and capital requirements for product development and commercialization of eptinezumab sooner than planned. We will also need to obtain substantial additional sources of funding to develop and commercialize ALD1910 and our other product candidates. We expect to finance future cash needs through equity financings, debt financings, collaborations, strategic alliances, licensing arrangements and other marketing and distribution arrangements, but there are no assurances that we will be able to raise sufficient amounts of funding in the future on acceptable terms, or at all. We currently have no credit facility or committed sources of capital. Because of the numerous risks and uncertainties associated with the development and commercialization of our product candidates and the extent to which we may enter into additional collaborations with third parties to participate in their development and commercialization, we are unable to estimate the amounts of increased capital outlays and operating expenditures associated with our current and anticipated clinical trials or with commercialization of our product candidates. If such additional funding is not available on favorable terms or at all, we may need to delay or reduce the scope of our development programs or grant rights in the United States, as well as outside the United States, to our product candidates to one or more partners.

Financial Operations Overview

Revenues

We recognized $1.6 million and $0.1 million in revenue in 2017 and 2016, respectively, relating to the sale of drug supply inventory of clazakizumab to Vitaeris at cost. We did not recognize any revenue in 2015.

We have not generated any revenues from the sale of products. In the future, we may generate revenues from product sales and from collaboration agreements in the form of license fees, milestone payments, reimbursements for clinical supply and development costs and royalties on product sales. We expect that any revenues we generate will fluctuate from quarter to quarter as a result of the uncertain timing and amount of such payments and sales.

Research and Development Expenses

Research and development expenses represent costs incurred by us for the discovery and development of our product candidates. The following items are included in research and development expenses:

- external costs under agreements with clinical research organizations, or CROs, contract manufacturing organizations, or CMOs, and other significant third-party vendors or consultants used to perform preclinical, clinical and manufacturing activities;
- internal costs including employee-related costs such as salaries, benefits, stock-based compensation expense, travel, laboratory consumables and services for our research and development personnel; and
- allocated facilities, depreciation, and other expenses, which include rent and maintenance of facilities, information technology services and other infrastructure expenses.

We use our employee and infrastructure resources across multiple research and development programs directed toward evaluating our monoclonal antibodies for selecting product candidates. We manage certain activities such as preclinical toxicology studies, clinical trial operations and manufacture of product candidates through third-party CROs, CMOs or other third-party vendors. We track our significant external costs by each product candidate. We also track our human resource efforts on certain programs for purposes of billing our collaborators for time incurred at agreed upon rates. We do not, however, assign or allocate to individual product candidates or development programs our internal costs and we group these internal research and development activities into three categories:

Category	Description
Preclinical discovery and development	Research and development expenses incurred in activities substantially in support of discovery of new targets through the selection of a single product candidate. These activities encompass the discovery and translational medicine functions, including pharmacokinetic and drug metabolism preclinical studies, toxicology and early strain and assay development activities.
Pharmaceutical operations	Research and development expenses incurred related to manufacturing preclinical study and clinical trial materials, including scale-up process development and quality control activities.
Clinical development	Research and development expenses incurred related to Phase 1, Phase 2 and Phase 3 clinical trials, including regulatory affairs and medical affairs activities.

Our research and development expenses during 2017, 2016 and 2015 were as follows:

	Years Ended December 31,		
	2017	2016	2015
	(in thousands)		
External costs:			
Eptinezumab	$182,056	$82,326	$37,764
ALD1910	6,626	—	—
ALD1613	—	6,025	5,272
Unallocated internal costs:			
Preclinical discovery and development	20,135	18,486	13,748
Pharmaceutical operations	24,036	18,051	9,834
Clinical development	20,049	7,872	2,993
Total research and development expenses	$252,902	$132,760	$69,611

We plan to increase our research and development expenses for the foreseeable future as we continue the development of eptinezumab, continue to develop our medical affairs capability, continue to prepare for regulatory submissions and advance ALD1910 and our future product candidates into clinical development. The timing and amount of research

and development expenses incurred will depend largely upon the outcomes of current and future clinical trials for our product candidates as well as the related regulatory requirements, manufacturing costs and any costs associated with the advancement of our preclinical programs. We cannot determine with certainty the duration and completion costs of the current or future clinical trials of our product candidates. The duration, costs and timing of clinical trials and development of our product candidates will depend on a variety of factors, including:

- the scope, rate of progress, and expense of our ongoing, as well as any additional, clinical trials and other research and development activities;
- future clinical trial results;
- potential changes in government regulation; and
- the timing and receipt of any regulatory approvals.

A change in the outcome of any of these variables with respect to the development of a product candidate could mean a significant change in the costs and timing associated with the development of that product candidate.

General and Administrative Expenses

General and administrative expenses consist primarily of salaries and related benefits, including stock-based compensation, related to our executive, business development, intellectual property, finance, human resources, investor relations, marketing and support functions. Other general and administrative expenses include allocated facility-related costs not otherwise included in research and development expenses, travel expenses and professional fees for marketing, auditing, tax and legal services, including intellectual property related legal services. We expect our general and administrative costs will rise in 2018 as we increase our headcount and expand our support staffing, build commercial infrastructure including information technology systems and personnel support for the commercial organization, and other activities to support our Company growth as we prepare for a potential commercial launch of eptinezumab.

Other Income (Expense)

Other income consists primarily of interest income received on our cash, cash equivalents, investments, and restricted cash, gains and losses on foreign currency and refundable Australian tax credits received by our wholly-owned Australian subsidiary. We anticipate other expenses to increase due to interest expense on the Notes.

Results of Operations

Comparison of the Years Ended December 31, 2017 and 2016

The following table summarizes our results of operations for 2017 and 2016, together with the changes in those items in dollars and as a percentage:

	Years Ended December 31,			
	2017	2016	Dollar change	% change
	(dollars in thousands)			
Revenues:				
Collaboration and license agreements	$1,619	$113	1,506	1333 %
Operating expenses:				
Cost of sales	1,619	113	1,506	1333 %

Research and development	252,902	132,760	120,142	90	%
General and administrative	38,102	26,148	11,954	46	%
Total operating expenses	292,623	159,021	133,602	84	%
Gain on license of clazakizumab	—	1,050	(1,050)	(100	%)
Loss from operations	(291,004)	(157,858)	(133,146)	(84	%)
Other income (expense)					
Interest income	2,495	1,966	529	27	%
Foreign currency gain (loss)	223	(349)	572	164	%
Other income	50	172	(122)	(71	%)
Total other income, net	2,768	1,789	979	55	%
Net loss before equity in net loss of unconsolidated entity	(288,236)	(156,069)	(132,167)	(85	%)
Equity in net loss of unconsolidated entity	(643)	(185)	(458)	(248	%)
Net loss	$(288,879)	$(156,254)	$(132,625)	(85	%)

Revenue and Cost of Sales

We recognized $1.6 million in revenue and cost of sales in 2017 relating to the sale of drug supply inventory of clazakizumab to Vitaeris at cost. We recognized $0.1 million in revenue and cost of sales in 2016 relating to the sale of drug supply inventory of clazakizumab to Vitaeris at cost.

Research and Development Expenses

	Years Ended December 31,			
	2017	2016	Dollar change	% change
	(dollars in thousands)			
External costs:				
Eptinezumab	$182,056	$82,326	$99,730	121 %
ALD1910	6,626	—	6,626	—
ALD1613	—	6,025	(6,025)	(100 %)
Unallocated internal costs:				
Preclinical discovery and development	20,135	18,486	1,649	9 %
Pharmaceutical operations	24,036	18,051	5,985	33 %
Clinical development	20,049	7,872	12,177	155 %
Total research and development expenses	$252,902	$132,760	$120,142	90 %

Research and development expenses increased by $120.1 million, or 90%, in 2017 compared to 2016. During 2017, external costs incurred for eptinezumab increased by $99.7 million, or 121%. The increased level of spending for eptinezumab was primarily due to an additional $81.7 million in manufacturing costs to prepare for commercial launch and $14.8 million in clinical trial costs. External costs for ALD1613 decreased $6.0 million due to termination of the development of this product candidate in 2016. External costs for ALD1910 increased by $6.6 million as we continued to advance the program. Unallocated internal costs increased by $19.8 million due primarily to an increase in salaries expense of $8.7 million and an increase in stock-based compensation expense of $5.1 million in 2017 as a result of a 27% increase in our research and development headcount to support our ongoing and planned pivotal clinical trials. In addition, unallocated internal cost increased in 2017 due to an increase of professional fees of $3.4 million and facilities related costs of $1.7 million.

General and Administrative Expenses

General and administrative expenses increased by $12.0 million, or 46%, for 2017 compared to 2016. The increase was primarily due to an increase in stock-based compensation expense of $3.5 million and an increase of $2.8 million in salaries expense due to a 28% increase in headcount, as well as an increase of $5.6 million in professional fees and other administrative costs primarily to support commercial readiness activities. We anticipate increases in general and administrative expenses for commercial marketing as we build out our commercial readiness infrastructure and

product launch plans for eptinezumab.

Gain on License of Clazakizumab

In May 2016, we licensed the exclusive worldwide rights to clazakizumab to Vitaeris. In exchange for the rights to clazakizumab, we received an equity stake in Vitaeris and are eligible to receive royalties and certain other payments. We recognized a gain on the license agreement of $1.1 million in 2016.

Interest Income

The increase of $0.5 million in interest income for the year ended 2017 compared to 2016 was due primarily due to a higher average interest rate on our average balances of cash, cash equivalents, investments, and restricted cash compared to the same period of 2016.

Foreign Currency Gain (Loss)

We maintain bank accounts denominated in British pounds, Swiss francs, Australian dollars and Euros for purposes of settling certain obligations arising outside the United States. We recognized a net foreign currency gain of $0.2 million in 2017 and a net foreign currency loss of $0.3 million in 2016 due in both years to fluctuations in the exchange rate primarily for British pounds relative to U.S. dollars.

Other Income

Other income primarily represents incentive payments received by our Australian subsidiary from the Australian government for eligible research and development expenditures in the prior calendar year. We received $0.1 million in such incentive payments in 2017 and $0.2 million in 2016.

Equity in Net Loss of Unconsolidated Entity

The equity in net loss of unconsolidated entity relates to our investment in Vitaeris. We record our share of any loss or income generated by Vitaeris under the equity method of accounting on a three-month lag. We recognized $0.6 and $0.2 million in equity in net loss for 2017 and 2016, respectively.

Comparison of the Years Ended December 31, 2016 and 2015

The following table summarizes our results of operations for 2016 and 2015, together with the changes in those items in dollars and as a percentage:

	Years Ended December 31,			
	2016	2015	Dollar change	% change
	(dollars in thousands)			
Revenues:				
Collaboration and license agreements	$113	$—	$ 113	—
Operating expenses:				
Cost of sales	113	—	113	—
Research and development	132,760	69,611	63,149	91 %
General and administrative	26,148	16,718	9,430	56 %
Total operating expenses	159,021	86,329	72,692	84 %
Gain on license of clazakizumab	1,050	—	1,050	—
Loss from operations	(157,858)	(86,329)	(71,529)	(83 %)

Other income (expense)					
Interest income	1,966	702	1,264	180	%
Foreign currency gain (loss)	(349)	73	(422)	(578	%)
Other income	172	84	88	105	%
Total other income, net	1,789	859	930	108	%
Net loss before equity in net loss of unconsolidated entity	(156,069)	(85,470)	(70,599)	(83	%)
Equity in net loss of unconsolidated entity	(185)	—	(185)	—	
Net loss	$(156,254)	$(85,470)	$ (70,784)	(83	%)

Revenues

We recognized $0.1 million in revenue and cost of sales in 2016 relating to the sale of drug supply inventory of clazakizumab to Vitaeris at cost. We did not recognize any revenue in 2015.

Research and Development Expenses

	Years Ended December 31,			
	2016	2015	Dollar change	% change
	(dollars in thousands)			
External costs:				
Eptinezumab	$82,326	$37,764	$ 44,562	118 %
ALD1613	6,025	5,272	753	14 %
Unallocated internal costs:				
Preclinical discovery and development	18,486	13,748	4,738	34 %
Pharmaceutical operations	18,051	9,834	8,217	84 %
Clinical development	7,872	2,993	4,879	163 %
Total research and development expenses	$132,760	$69,611	$ 63,149	91 %

Research and development expenses increased by $63.1 million, or 91%, in 2016 compared to 2015. During 2016, external costs incurred for eptinezumab increased by $44.6 million, or 118%. The increased level of spending for eptinezumab was primarily due to an additional $21.1 million in clinical trial costs and $23.5 million in manufacturing costs for drug supply in support of planned and ongoing pivotal clinical trials. External costs for ALD1613 increased $0.8 million due to an increase in preclinical studies offset by a decrease in manufacturing costs before we terminated the development of this product candidate in mid-2016. Unallocated internal costs also increased by $17.4 million due primarily to an increase in salaries expense of $8.4 million and an increase in stock-based compensation expense of $4.1 million in 2016 as a result of a 53% increase in our research and development headcount to support our ongoing and planned pivotal clinical trials.

General and Administrative Expenses

General and administrative expenses increased by $9.4 million, or 56%, for 2016 compared to 2015. The increase was primarily due to an increase in stock-based compensation expense of $3.7 million and an increase of $3.0 million in salaries expense due to a 68% increase in headcount, as well as increases in commercial readiness activities, business insurance and other administrative costs.

Gain on License of Clazakizumab

In May 2016, we licensed the exclusive worldwide rights to clazakizumab to Vitaeris. In exchange for the rights to clazakizumab, we received an equity stake in Vitaeris and are eligible to receive royalties and certain other payments. We recognized a gain on the license agreement of $1.1 million in 2016.

Interest Income

The increase of $1.3 million in interest income for 2016 compared to 2015 was due primarily to increases in the average balances of cash, cash equivalents and investments.

Foreign Currency Gain (Loss)

Other income (expense) recognized from foreign currency gains (losses) decreased $0.4 million for 2016 compared to 2015. We maintain bank accounts denominated in British pounds, Swiss francs, Australian dollars and Euros for purposes of settling certain obligations arising outside the United States. We recognized a net foreign currency loss of $0.3 million in 2016 and a net foreign currency gain of $0.1 million in 2015 due primarily in both years to fluctuations in the exchange rate for British pounds relative to U.S. dollars.

Other Income

Other income primarily represents incentive payments received by our Australian subsidiary from the Australian government for eligible research and development expenditures in the prior calendar year. We received $0.2 million in such incentive payments in 2016 and $0.1 million in 2015. The increase in the incentive payments received in 2016 was due to a higher level of eligible expenditures in Australia in 2015 compared to expenditures in 2014.

Equity in Net Loss of Unconsolidated Entity

The equity in net loss of unconsolidated entity relates to our investment in Vitaeris. We record our share of any loss or income generated by Vitaeris under the equity method of accounting on a three-month lag. We recognized $0.2 million in equity in net loss for 2016. There was no equity in net loss of unconsolidated entity in 2015.

Liquidity and Capital Resources

Due to our significant research and development expenditures, we have generated significant operating losses from inception and we expect to incur significant operating losses in the future. We have funded our operations primarily through sales of our equity securities and payments from our former collaboration partners. As of December 31, 2017, we had an accumulated deficit of $667.5 million and cash, cash equivalents and short-term investments of $276.2 million, consisting of cash, money market funds and U.S. government agency obligations, and restricted cash of $10.0 million. In July 2017, we completed an underwritten public offering of 17,250,000 shares of common stock resulting in net proceeds of $161.5 million, after deducting underwriting discounts, commissions and offering expenses. In January 2018, we completed offering private placement of 725,268 shares of convertible preferred stock resulting in net proceeds of approximately $97.7 million. In February 2018, we received approximately $277.7 million in net proceeds from an underwritten public offering of the Notes. The purchase agreement for the placement of the convertible preferred stock, and a right we had under such agreement to sell to the investors an additional $150 million of convertible preferred stock, terminated upon the closing of the Notes offering and no additional shares will be issued under such agreement, except in the event of warrants issued and exercised as a result of a deemed liquidation event. Cash in excess of immediate requirements is invested with a view toward liquidity and capital preservation, and we seek to minimize the potential effects of concentration and degrees of risk.

We are focusing our resources and development efforts principally on eptinezumab in order to maximize its therapeutic and commercial potential. We believe that our available cash, cash equivalents, short-term investments and restricted cash as of December 31, 2017, together with the proceeds received from the January 2018 private placement of convertible preferred stock and February 2018 Notes offering, will be sufficient to achieve a U.S. commercial launch of eptinezumab on our expected schedule, assuming regulatory approval, and meet our projected operating requirements into 2020. We have based our estimate on the timing for our projected expenditures on assumptions that may prove to be wrong, and we could utilize our available capital resources sooner than we currently expect. Furthermore, our operating plans may change, and we may need additional funds to meet operational needs and capital requirements for product development and commercialization of eptinezumab sooner than planned. We will also need to obtain substantial additional sources of funding to develop and commercialize ALD1910 and our other product candidates. We expect to finance future cash needs through equity financings, debt financings, collaborations, strategic alliances, licensing arrangements and other marketing and distribution arrangements, but there are no assurances that we will be able to raise sufficient amounts of funding in the future on acceptable terms, or at all. We currently have no credit facility or committed sources of capital. Because of the numerous risks and uncertainties associated with the development and commercialization of our product candidates and the extent to which we may enter into additional collaborations with third parties to participate in their development and commercialization, we are unable to estimate the amounts of increased capital outlays and operating expenditures associated with our current and anticipated clinical trials or with commercialization of our product candidates. Our future funding requirements will depend on many factors, as we:

- continue to prioritize the advancing clinical development of eptinezumab for the prevention of migraine;

- leverage the commercial potential of eptinezumab by commercializing it for the prevention of migraine in the United States, if approved by the FDA;
- advance the ALD1910 program;
- establish a sales, marketing and distribution infrastructure and scale-up manufacturing capabilities to commercialize eptinezumab or any of our future product candidates if they receive regulatory approval;
- enhance operational, financial and information management systems and hire additional personnel, including personnel to support development of our product candidates and, if a product candidate is approved, our commercialization efforts.
- leverage our technology platform to discover future product candidates for areas of unmet need; and
- build a leading biopharmaceutical company to transform current treatment paradigms.

There are no assurances that we will be able to raise sufficient amounts of funding in the future on acceptable terms, or at all. The sale of additional equity would result in dilution to our stockholders. The incurrence of debt financings would result in debt service obligations and the instruments governing such debt could provide for operating and financing covenants that would restrict our operations. We may consider partnering one or more of our product candidates for further clinical development and commercialization. To the extent that we raise additional capital through marketing and distribution arrangements or other collaborations, strategic alliances or licensing arrangements with third parties, we may have to relinquish valuable rights to our

product candidates, future revenue streams, research programs or product candidates or to grant licenses on terms that may not be favorable to us.

Historical Cash Flow Trends

For the year ended December 31, 2017, we early adopted ASU 2016-18, Statement of Cash Flows – Restricted Cash and retrospectively applied the change to the consolidated statement of cash flows. As of December 31, 2017, we had $10 million in restricted cash which is now included with cash and cash equivalents when reconciling the beginning-of-period and end-of-period amounts shown on the consolidated statements of cash flows. The following table summarizes our cash flows for the periods indicated:

	Years Ended December 31,		
	2017	2016	2015
	(in thousands)		
Net cash used in operating activities	$(226,617)	$(159,687)	$(81,233)
Net cash provided by (used in) investing activities	34,380	(67,720)	(167,267)
Net cash provided by financing activities	162,917	137,110	408,206

Cash Used in Operating Activities

Net cash used in operating activities includes net loss, adjusted for non-cash charges and the changes in deferred revenue and components of working capital. Net cash used in operating activities was $226.6 million in 2017 compared to $159.7 million in 2016. The $66.9 million increase in net cash used in operating activities in 2017 compared to 2016 was driven primarily by an increase in net loss of $132.6 million which is offset by a $68.7 million decrease in prepaid expenses, of which $37.0 million was due to the recognition of manufacturing expenses in support of our commercial readiness activities for eptinezumab which were prepaid at December 31, 2016 and therefore did not use cash during the year ended December 31, 2017. Other changes which also increased cash used in operating activities compared to the prior year period were due to a decrease of $7.9 million in the change in accounts payable and a decrease of $7.5 million in the change in accrued liabilities offset by an increase in stock-based compensation of $8.5 million due to increases in headcount to support our programs under development.

Net cash used in operating activities was $159.7 million in 2016 compared to $81.2 million in 2015. The $78.5 million increase in net cash used in operating activities in 2016 compared to 2015 was driven primarily by an increase in net loss of $70.8 million, offset by an increase in stock-based compensation of $7.8 million due to increases in headcount to support our programs under development, and the change in accounts payable and accrued liabilities increased by $2.7 million and $3.6 million, respectively. In addition, cash used in operating activities increased by $21.6 million primarily related to prepaid manufacturing costs in support of drug development for our clinical trials.

Cash Provided by (Used in) Investing Activities

Net cash provided by investing activities was $34.4 million in 2017 due primarily to sales and maturities of investments, offset in part by purchases of investments. Purchases of property and equipment used cash of $2.1 million. We anticipate additional purchases of property and equipment for tenant improvements in support of additional leased space for the foreseeable future.

Net cash used in investing activities was $67.7 million and $167.3 million in 2016 and 2015, respectively, due primarily to purchases of investments, offset in part by sales and maturities of investments. Purchases of property and equipment used cash of $6.6 million and $1.2 million in 2016 and 2015, respectively.

Cash Provided by Financing Activities

Net cash provided by financing activities in 2017 was $162.9 million due primarily to the July 2017 public offering in which we received proceeds of $161.5 million net of underwriting discounts, commissions and offering costs, and $1.4 million from the exercise of stock options and purchases under the employee stock purchase plan.

Net cash provided by financing activities in 2016 was $137.1 million due primarily to the April 2016 public offering in which we received proceeds of $134.9 million net of underwriting discounts, commissions and offering costs, and $2.2 million from the exercise of stock options and purchases under the employee stock purchase plan.

Net cash provided by financing activities in 2015 was $408.2 million due primarily to underwritten public offerings of our common stock in January and June 2015 in which we received $406.6 million net of underwriting discounts, commissions and offering costs, and $1.5 million from the exercise of stock options and purchases under the employee stock purchase plan.

Off-Balance Sheet Arrangements

We did not have any off-balance sheet arrangements during 2017.

Contractual Obligations

Our contractual obligations as of December 31, 2017 were as follows:

	Total	2018	2019	2020	2021	2022	Thereafter
	(in thousands)						
Operating lease obligations[1]	$8,335	$1,395	$1,434	$1,477	$1,521	$1,568	$ 940
License agreements[2]	715	60	60	60	60	60	415
Purchase obligations[3]	15,732	15,732	—	—	—	—	—
Contract manufacturing obligations[4]	212,812	71,786	57,202	54,688	29,136	—	—
Total contractual obligations	$237,594	$88,973	$58,696	$56,225	$30,717	$1,628	$ 1,355

(1) Represents future minimum lease payments under our non-cancelable operating lease. The minimum lease payments above do not include any related common area maintenance charges or real estate taxes.
(2) Some of our licensing agreements obligate us to pay a royalty on net sales of products utilizing licensed technology. Such royalties are dependent on future product sales and are not provided for in the table above as they are not estimable.
(3) We enter into agreements in the normal course of business with contract research organizations for clinical trials and with vendors for preclinical research studies and other services and products for operating purposes which are cancelable at any time by us, generally upon 30 days prior written notice. These payments are not included in this table of contractual obligations.
(4) Represents contractual obligations related to manufacturing our product candidates for use in our clinical trials, including long-term stability studies. Includes estimated purchase obligations as of December 31, 2017 under

agreements with third-party contract manufacturing organizations for larger scale production of eptinezumab. This includes obligations for which we have placed $10.0 million in an escrow account which is classified as non-current restricted cash on our consolidated balance sheet. We expect to incur additional purchase obligations relating to future purchase orders under such agreements.

Certain contract manufacturing obligations may be cancelled 18 to 24 months prior to the commencement date of the manufacturing campaign. Although the payment of the cancellation fee will generally be due at the scheduled commencement date, we may record the manufacturing expense and related obligation as an accrued liability at the time of cancellation.

Newly Adopted Accounting Pronouncements

For a discussion of recently issued accounting pronouncements, please see Note 2 to our consolidated financial statements, which are included in this report.

Critical Accounting Policies and Significant Judgments and Estimates

Our management's discussion and analysis of our financial condition and results of operations is based on our financial statements, which have been prepared in accordance with United States generally accepted accounting principles, or U.S. GAAP. The preparation of these financial statements requires us to make estimates and assumptions that affect the reported amounts of assets and liabilities and the disclosure of contingent assets and liabilities at the date of the financial statements, as well as the reported revenues generated and expenses incurred during the reporting periods. Our estimates are based on our historical experience and on various other factors that we believe are reasonable under the circumstances, the results of which form the basis for making judgments about the carrying value of assets and liabilities that are not readily apparent from other sources. Actual results may differ from these estimates under different assumptions or conditions. We believe that the accounting policies discussed below are critical to understanding our historical and future performance, as these policies relate to the more significant areas involving management's judgments and estimates.

Equity Method of Accounting

We have a relationship with a variable interest entity ("VIE"). We evaluate VIEs to determine whether we are the primary beneficiary by performing a qualitative and quantitative analysis of each VIE that includes a review of, among other factors, the VIE's

capital structure, contractual terms, related party relationships, our fee arrangements and the design of the VIE. This analysis includes determining whether we (1) have the power to direct matters that most significantly impact the activities of the VIE, and (2) have the obligation to absorb losses or the right to receive benefits of the VIE that could potentially be significant to the VIE.

In circumstances where we are not the primary beneficiary, but we have the ability to exercise significant influence over the operating and financial policies of a company in which we have an investment, we utilize the equity method of accounting for recording investment activity. In assessing whether we exercise significant influence, we consider the nature and magnitude of our investment, the voting and protective rights we hold, any participation in the governance of the other company, and other relevant factors such as the presence of a collaboration or other business relationship. Under the equity method of accounting, we record in our results of operations our share of income or loss of the other company. If our share of losses exceeds the carrying value of our investment, we will suspend recognizing additional losses and will continue to do so unless we commit to providing additional funding. We monitor our investment to evaluate whether any decline in value has occurred that would be other-than-temporary, based on the implied value of recent company financings, public market prices of comparable companies, and general market conditions. The carrying value of the investment is included in our consolidated balance sheet as investment in unconsolidated entity.

Revenue Recognition

We recognize revenues from collaboration, license or research service contract arrangements when persuasive evidence of an arrangement exists, delivery has occurred or services have been rendered, the price is fixed or determinable and collectability is reasonably assured.

We evaluate multiple-element arrangements to determine (1) the deliverables included in the arrangement and (2) whether the individual deliverables represent separate units of accounting or whether they must be accounted for as a single unit of accounting. This evaluation involves subjective determinations and requires us to make judgments about the individual deliverables and whether such deliverables are separable from the other aspects of the contractual relationship. Deliverables are considered separate units of accounting provided that the delivered item has value to the customer on a standalone basis, and if the arrangement includes a general right of return with respect to the delivered item, delivery or performance of the undelivered item is considered probable and substantially in our control. In assessing whether an item has standalone value, we consider factors such as the research, development, manufacturing and commercialization capabilities of the collaboration partner and the availability of the associated expertise in the general marketplace. In addition, we consider whether the collaboration partner can use any other deliverable for its intended purpose without the receipt of the remaining deliverable, whether the value of the deliverable is dependent on the undelivered item and whether there are other vendors that can provide the undelivered items. For sales of drug supply inventory at cost, the revenue is recognized upon transfer of the inventory. For revenue arrangements entered into prior to January 1, 2011, we were also required to evaluate whether there was fair value of the undelivered elements in the arrangement. The deliverables under our 2009 BMS collaboration agreement did not qualify as separate units of accounting and accordingly are accounted for as a single unit of accounting.

The consideration received under an arrangement which contains separate units of accounting is allocated among the separate units using the relative selling price method. We determine the estimated selling price for units of accounting within each arrangement using vendor-specific objective evidence, or VSOE, of selling price, if available, third-party evidence, or TPE, of selling price if VSOE is not available, or best estimate of selling price, or BESP, if neither VSOE

nor TPE is available.

When we have substantive performance obligations under an arrangement accounted for as one unit of accounting, revenues are recognized using either a time-based or proportional performance-based approach. When we cannot estimate the total amount of performance obligations that are to be provided under the arrangement, a time-based method is used. Under the time-based method, revenues are recognized over the arrangement's estimated performance period based on the elapsed time compared to the total estimated performance period. When we are able to estimate the total amount of performance obligations under the arrangement, revenues are recognized using a proportional performance model. Under this approach, revenue recognition is based on costs incurred to date compared to total expected costs to be incurred over the performance period as this is considered to be representative of the delivery of service under the arrangement. Changes in estimates of total expected performance costs or service obligation time period are accounted for prospectively as a change in estimate. Under both methods, revenues recognized at any point in time are limited to the amount of noncontingent payments received or due.

We may also perform research and development activities on behalf of collaborative partners that are paid for by the collaborators. For research and development activities which are not determined to be separate units of accounting based on the criteria above, revenues for these research and development activities are recognized using the single unit of accounting method for that collaborative arrangement. For research and development activities which are determined to be separate units of accounting, arrangement consideration is allocated and revenues are recognized as services are delivered, assuming the general criteria for revenue recognition noted above have been met. The corresponding research and development costs incurred under these contracts are included in research and development expense in the consolidated statements of operations.

We generally invoice collaborators upon the completion of the effort, based on the terms of each agreement. Amounts earned, but not yet collected from the collaborators, if any, are included in accounts receivable in the accompanying consolidated balance

sheets. Deferred revenue arises from payments received in advance of the culmination of the earnings process. Deferred revenue expected to be recognized within the next 12 months is classified as a current liability. Deferred revenue will be recognized as revenue in future periods when the applicable revenue recognition criteria have been met.

Accrued Expenses

As part of the process of preparing financial statements, we are required to estimate and accrue expenses, the largest of which are research and development expenses. Costs for certain development activities are recognized based on an evaluation of the progress to completion of specific tasks using information and data provided to us by our vendors and our clinical sites. This process involves the following:

- communicating with our applicable 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 actual cost;

- estimating and accruing expenses in our financial statements as of each balance sheet date based on facts and circumstances known to us at the time; and

- periodically confirming the accuracy of our estimates with selected service providers and making adjustments, if necessary.

Examples of estimated research and development expenses that we accrue include:

- fees paid to CROs in connection with preclinical and toxicology studies and clinical trials;

- fees paid to clinical sites in connection with clinical trials.

We base our expense accruals related to clinical trials on our estimates of the services received and efforts expended pursuant to contracts with multiple research institutions and CROs that conduct and manage clinical trials on our behalf. The financial terms of these agreements vary from contract to contract and may result in uneven payment flows. Payments under some of these contracts depend on factors, such as the successful enrollment of patients and the completion of clinical trial milestones. 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 we do not identify costs that we have begun to incur or if we underestimate or overestimate the level of services performed or the costs of these services, our actual expenses could differ from our estimates. For service contracts entered into that include a nonrefundable prepayment

for service the upfront payment is deferred and recognized in the consolidated statement of operations as the services are rendered.

Other than described above, we have not experienced significant changes in our critical accounting policies after a reporting period. However, due to the nature of estimates, we cannot assure you that we will not make changes to our estimates in the future as we become aware of additional information about the status or conduct of our clinical trials and other research activities.

Stock-Based Compensation

Stock-based compensation cost is measured on the grant date, based on the estimated fair value of the award using a Black-Scholes pricing model and recognized as an expense over the employee's requisite service period on a straight-line basis. We recorded stock-based compensation expense of $22.5 million, $14.0 million and $6.1 million for 2017, 2016 and 2015, respectively. At December 31, 2017, we had $45.8 million and $2.1 million of total unrecognized stock-based compensation expense, net of estimated forfeitures, related to stock option grants and employee stock purchase plan awards, respectively, that will be recognized over a weighted average period of 2.6 years and 1.1 years, respectively. We expect to continue to grant stock options and restricted stock awards pursuant to our 2014 Equity Incentive Plan and to allow employees to purchase shares of our common stock pursuant to our 2014 Employee Stock Purchase Plan, and to the extent that we do, our stock-based compensation expense recognized in future periods will likely increase.

We account for stock-based compensation arrangements with non-employees using a fair value approach. The fair value of these options is measured using the Black-Scholes option pricing model reflecting the same assumptions as applied to employee options in each of the reported periods, other than the expected life, which is assumed to be the remaining contractual life of the option. The compensation costs of these arrangements are subject to remeasurement over the vesting terms as earned.

Key Assumptions

Our Black-Scholes option-pricing model requires the input of highly subjective assumptions, including the expected volatility of the price of our common stock, the expected term of the option, risk-free interest rates, the expected dividend yield of our common stock and, for the period prior to our IPO, the fair value of the underlying common stock. These estimates involve inherent uncertainties and the application of management's judgment. If factors change and different assumptions are used, our stock-based compensation expense could be materially different in the future.

In determining the fair value of stock awards granted, the following weighted average assumptions were used in the Black-Scholes option pricing model for awards granted in the periods indicated:

	Stock Options Years Ended December 31,			Employee Stock Purchase Plan Year Ended December 31,		
	2017	2016	2015	2017	2016	2015
Volatility	61.6%	60.5%	59.5%	66.8%	68.0%	57.0%
Expected term (years)	6.1	6.1	6.1	1.4	1.4	0.9
Risk-free interest rate	2.1%	1.4%	1.6%	1.5%	0.8%	0.3%
Dividend rate	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Income Taxes

We use the asset and liability method of accounting for income taxes. Deferred income tax assets and liabilities are recognized for the future tax consequences attributable to the differences between the financial statement carrying amounts of existing assets and liabilities and their respective tax basis. Deferred income tax assets and liabilities are measured using enacted tax rates expected to be in effect when such assets and liabilities are recovered or settled. The effect on deferred income tax assets and liabilities of a change in tax rates is recognized in the period that includes the enactment date.

On December 22, 2017, the Tax Cuts and Jobs Act of 2017 (the "TCJA") was signed into law, making significant changes to the Internal Revenue Code. Key aspects include, but are not limited to, a decrease in the highest corporate tax bracket from 35% to 21% effective for tax years beginning after December 31, 2017, the transition of the U.S international taxation from the existing worldwide tax system to a territorial system, and a one-time transition tax on previously deferred foreign earnings as of December 31, 2017. We have calculated the impact of the TCJA in our year end income tax provision in accordance with our interpretation and guidance available as of the date of this filing. We have recorded no additional income tax expense in 2017 based on the use of our existing net operating losses, or NOLs, to offset the additional income inclusion generated by the provisions of the TCJA. The provisional amounts related to the remeasurement of deferred tax assets and liabilities, based on the rates at which they are expected to reverse in the future, as well as to the one-time tax reform transition taxable income inclusion on accumulated

earnings and profits of foreign corporations that were previously untaxed by the U.S., are disclosed in our discussion below.

Additionally, the TCJA restructured the existing NOL deduction and carryforward credit for companies with NOL deferred tax assets. Any NOLs generated in years after December 31, 2017 will now be allowed to be carried forward indefinitely, but will be limited to 80% of taxable income. The TCJA removes the carryback period on NOLs generated after 2017, however the 20-year carryforward and 2-year carryback period still apply to existing NOLs generated through 2017.

We determine deferred income tax assets and liabilities, based on temporary differences between the book and tax bases of assets and liabilities. We believe that it is currently more likely than not that our deferred income tax assets will not be realized, and as such, we have recorded a full valuation allowance.

We utilize a two-step approach for evaluating uncertain tax positions. Step one, recognition, requires us to determine if the weight of available evidence indicates that a tax position is more likely than not to be sustained upon audit, including resolution of related appeals or litigation processes, if any. If a tax position is not considered “more likely than not” to be sustained, no benefits of the position are recognized. If we determine that a position is “more likely than not” to be sustained, then we proceed to step two, measurement, which is based on the largest amount of benefit which is more likely than not to be realized on effective settlement. This process involves estimating our actual current tax exposure, including assessing the risks associated with tax audits, together with assessing temporary differences resulting from the different treatment of items for tax and financial reporting purposes. If actual results differ from our estimates, our NOLs and tax credit carryforwards could be materially impacted.

We file U.S. federal income, as well as Australia and Ireland tax returns. For 2017, we anticipate filing tax returns for state income tax purposes. To date, we have not been audited by the Internal Revenue Service or any other foreign or state income tax authority. As of December 31, 2017, our total deferred income tax assets were $158.1 million. Due to our history of net operating losses and evaluation of available positive and negative evidence, including scheduled reversals of deferred tax liabilities, projected

future taxable income, tax planning strategies, and the ability to carry back NOLs to prior years, we have determined that it is more likely than not that our deferred income tax assets will not be realized, and therefore, the deferred income tax assets are fully offset by a valuation allowance at December 31, 2017. The deferred income tax assets were primarily comprised of U.S. NOLs and tax credit carryforwards. As of December 31, 2017, we had NOL carryforwards of $643.1 million and federal tax credit carryforwards of $17.9 million to offset future taxable income or offset income taxes due. These NOLs expire from 2025 to 2037 and the tax credit carryforwards expire from 2024 to 2037, if not utilized.

On December 22, 2017, Staff Accounting Bulletin No. 118 ("SAB 118") was issued to address the application of U.S. 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 Act. This standard will not have a material impact to the financial statements.

Item 7A. Quantitative and Qualitative Disclosures about Market Risk

Interest Rate Risk

The primary objective of our investment activities is to preserve our capital to fund our operations. We also seek to maximize income from our investments without assuming significant risk. To achieve our objectives, we maintain a portfolio of cash equivalents and investments in a variety of securities of high credit quality. As of December 31, 2017, we had cash, cash equivalents and short-term investments of $276.2 million consisting of cash, money market accounts, and U.S. government agency obligations, and restricted cash of $10.0 million. A portion of our investments may be subject to interest rate risk and could fall in value if market interest rates increase. We have estimated the effect on our investment portfolio of a hypothetical increase in interest rates by one percent to be a reduction of $0.3 million in the fair value of our investments as of December 31, 2017. In addition, a hypothetical decrease of 10% in the effective yield of our investments would reduce our expected investment income by approximately $0.3 million over the next twelve months based on our investment balance at December 31, 2017.

Foreign Currency Risk

We contract for the conduct of certain clinical development activities with vendors in Australia and we contract for the conduct of manufacturing activities in the United Kingdom, Switzerland and Austria. Our foreign subsidiaries in Australia and Ireland also maintain bank accounts in their local currencies which are Australian dollars and Euros. We are subject to exposure due to fluctuations in foreign exchange rates in connection with these currencies, as well as fluctuations in British pounds and Swiss francs. We manage a portion of these cash flow exposures through our bank accounts in which we hold foreign currencies. Our holdings in foreign currencies are marked to market at the end of each period and any net change is recorded as gains or losses in the consolidated statements of operations. As of December 31, 2017, we held the U.S. dollar equivalent of $3.2 million in British pounds, $0.7 million in Australian dollars, and $0.2 million in Euros. A hypothetical 10% change in the exchange rate between the U.S. dollar and the British pounds, Australian dollars, and Euros from the December 31, 2017 rate would have increased/decreased our total unrealized foreign currency loss on our holdings by approximately $0.4 million. We generally transfer funds to our Australian subsidiary and our Irish subsidiary to fund operating needs within 30 days of disbursement and these cash balances are also subject to exposure due to fluctuations in exchange rates. For the year ended December 31, 2017, we recorded a net foreign currency gain of $0.2 million in our consolidated statements of operations.

Item 8. Financial Statements and Supplementary Data

INDEX TO CONSOLIDATED FINANCIAL STATEMENTS

ALDER BIOPHARMACEUTICALS, INC.

Report of Independent Registered Public Accounting Firm

To the Board of Directors and Stockholders of Alder BioPharmaceuticals, Inc.:

Opinions on the Financial Statements and Internal Control over Financial Reporting

We have audited the accompanying consolidated balance sheets of Alder BioPharmaceuticals, Inc. and its subsidiaries as of December 31, 2017 and 2016, and the related consolidated statements of operations, comprehensive loss, stockholders' equity and cash flows for each of the three years in the period ended December 31, 2017, including the related notes (collectively referred to as the "consolidated financial statements"). We also have audited the Company's internal control over financial reporting as of December 31, 2017, based on criteria established in Internal Control - Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO).

In our opinion, the consolidated financial statements referred to above present fairly, in all material respects, the financial position of the Company as of December 31, 2017 and 2016, and the results of their operations and their cash flows for each of the three years in the period ended December 31, 2017 in conformity with accounting principles generally accepted in the United States of America. Also in our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of December 31, 2017, based on criteria established in Internal Control - Integrated Framework (2013) issued by the COSO.

Basis for Opinions

The Company's management is responsible for these consolidated financial statements, for maintaining effective internal control over financial reporting, and for its assessment of the effectiveness of internal control over financial reporting, included in Management's Annual Report on Internal Control over Financial Reporting. Our responsibility is to express opinions on the Company's consolidated financial statements and on the Company's internal control over financial reporting 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 audits to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud, and whether effective internal control over financial reporting was maintained in all material respects.

Our audits of the consolidated financial statements included performing procedures to assess the risks of material misstatement of the consolidated 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 consolidated 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 consolidated financial statements. Our audit of internal control over financial reporting included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, and testing and evaluating the design and operating effectiveness of internal control based on the assessed risk. Our audits also included performing such other procedures as we considered necessary in the circumstances. We believe that our audits provide a reasonable basis for our opinions.

Definition and Limitations of Internal Control over Financial Reporting

A company’s internal control over financial reporting is a process designed 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. A company’s internal control over financial reporting includes those policies and procedures that (i) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (ii) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (iii) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company’s assets that could have a material effect on the financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, 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.

/s/ PricewaterhouseCoopers LLP

Seattle, Washington

February 26, 2018

We have served as the Company's auditor since 2007.

Alder BioPharmaceuticals, Inc.

Consolidated Balance Sheets

	December 31,	
	2017	2016
	(in thousands, except share and per share data)	
Assets		
Current assets		
Cash and cash equivalents	$76,896	$116,216
Short-term investments	199,344	235,651
Prepaid expenses and other assets	11,014	40,380
Inventory	—	936
Total current assets	287,254	393,183
Property and equipment, net	5,630	7,076
Restricted cash	10,000	—
Investment in unconsolidated entity	222	865
Other assets	30	8,030
Total assets	$303,136	$409,154
Liabilities and stockholders' equity		
Current liabilities		
Accounts payable	$7,471	$10,361
Accrued liabilities	15,803	15,437
Deferred rent	92	92
Total current liabilities	23,366	25,890
Long-term deferred rent	495	481
Total liabilities	23,861	26,371
Commitments and contingencies (Note 16)		
Stockholders' equity		
Preferred stock; $0.0001 par value; 10,000,000 shares authorized; no shares issued and outstanding	—	—
Common stock; $0.0001 par value; 200,000,000 shares authorized; 67,842,942 and 50,368,206 shares issued and outstanding, respectively	7	5
Additional paid-in capital	946,869	761,456
Accumulated deficit	(667,509)	(378,630)
Accumulated other comprehensive loss	(92)	(48)
Total stockholders' equity	279,275	382,783
Total liabilities and stockholders' equity	$303,136	$409,154

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

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Alder BioPharmaceuticals, Inc.

Consolidated Statements of Operations

	Years Ended December 31,		
	2017	2016	2015
	(in thousands, except share and per share data)		
Revenues			
Collaboration and license agreements	$1,619	$113	$—
Operating expenses			
Cost of sales	1,619	113	—
Research and development	252,902	132,760	69,611
General and administrative	38,102	26,148	16,718
Total operating expenses	292,623	159,021	86,329
Gain on license of clazakizumab	—	1,050	—
Loss from operations	(291,004)	(157,858)	(86,329)
Other income (expense)			
Interest income	2,495	1,966	702
Foreign currency gain (loss)	223	(349)	73
Other income	50	172	84
Total other income, net	2,768	1,789	859
Net loss before equity in net loss of unconsolidated entity	(288,236)	(156,069)	(85,470)
Equity in net loss of unconsolidated entity	(643)	(185)	—
Net loss	$(288,879)	$(156,254)	$(85,470)
Net loss per share - basic and diluted	$(4.95)	$(3.23)	$(2.11)
Weighted average number of common shares used in net loss per share - basic and diluted	58,347,284	48,407,565	40,586,980

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

Alder BioPharmaceuticals, Inc.

Consolidated Statements of Comprehensive Loss

	Years Ended December 31,		
	2017	2016	2015
	(in thousands)		
Net loss	$(288,879)	$(156,254)	$(85,470)
Other comprehensive income (loss):			
Unrealized gain (loss) on securities available-for-sale, net of tax	(44)	432	(470)
Foreign currency translation income (loss), net of tax	—	21	(9)
Total other comprehensive income (loss)	(44)	453	(479)
Comprehensive loss	$(288,923)	$(155,801)	$(85,949)

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

Alder BioPharmaceuticals, Inc.

Consolidated Statements of Stockholders' Equity

	Common Stock Shares	Amount	Additional Paid-in Capital	Accumulated Deficit	Accumulated Other Comprehensive Loss	Total Stockholders' Equity
	(in thousands, except for share data)					
Balances at December 31, 2014	30,996,526	$ 3	$ 196,082	$ (136,906)	$ (22)	$ 59,157
Net loss	—	—	—	(85,470)	—	(85,470)
Other comprehensive loss	—	—	—	—	(479)	(479)
Issuance of common stock, net of offering costs	12,068,539	1	406,633	—	—	406,634
Exercise of stock options	548,491	—	701	—	—	701
Shares issued under employee stock purchase plan	93,233	—	835	—	—	835
Stock-based compensation	—	—	6,139	—	—	6,139
Balances at December 31, 2015	43,706,789	4	610,390	(222,376)	(501)	387,517
Net loss	—	—	—	(156,254)	—	(156,254)
Other comprehensive income	—	—	—	—	453	453
Issuance of common stock, net of offering costs	6,182,795	1	134,870	—	—	134,871
Exercise of stock options	376,919	—	921	—	—	921
Shares issued under employee stock purchase plan	101,703	—	1,318	—	—	1,318
Stock-based compensation	—	—	13,957	—	—	13,957
Balances at December 31, 2016	50,368,206	5	761,456	(378,630)	(48)	382,783
Net loss	—	—	—	(288,879)	—	(288,879)
Other comprehensive loss	—	—	—	—	(44)	(44)
Issuance of common stock, net of offering costs	17,250,000	2	161,480	—	—	161,482
Exercise of stock options	110,921	—	189	—	—	189
Shares issued under employee stock purchase plan	113,815	—	1,246	—	—	1,246
Stock-based compensation	—	—	22,498	—	—	22,498
Balances at December 31, 2017	67,842,942	$ 7	$ 946,869	$ (667,509)	$ (92)	$ 279,275

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

Alder BioPharmaceuticals, Inc.

Consolidated Statements of Cash Flows

	Years Ended December 31,		
	2017	2016	2015
	(in thousands)		
Operating activities			
Net loss	$(288,879)	$(156,254)	$(85,470)
Adjustments to reconcile net loss to net cash used in operating activities			
Non-cash gain on license of clazakizumab in exchange for investment in unconsolidated entity	—	(1,050)	—
Equity in net loss of unconsolidated entity	643	185	—
Depreciation and amortization	3,001	1,674	751
Stock-based compensation	22,498	13,957	6,139
Other non-cash charges, net	(167)	407	17
Changes in operating assets and liabilities			
Accounts receivable	—	—	113
Prepaid expenses and other assets	37,366	(31,374)	(9,744)
Inventory	936	(936)	—
Accounts payable	(2,395)	5,488	2,816
Accrued liabilities	366	7,843	4,273
Deferred rent	14	373	(128)
Net cash used in operating activities	(226,617)	(159,687)	(81,233)
Investing activities			
Purchases of investments	(305,540)	(165,871)	(185,629)
Proceeds from maturities of investments	341,819	104,765	19,335
Proceeds from sales of investments	151	—	250
Purchases of property and equipment	(2,050)	(6,619)	(1,223)
Proceeds from sale of property and equipment	—	5	—
Net cash provided by (used in) investing activities	34,380	(67,720)	(167,267)
Financing activities			
Proceeds from issuance of common stock, net of offering costs	161,482	134,871	406,634
Deferred offering costs	—	—	36
Proceeds from exercise of stock options and employee stock purchase plan	1,435	2,239	1,536
Net cash provided by financing activities	162,917	137,110	408,206
Effect of exchange rate changes on cash, cash equivalents and restricted cash	—	21	(9)
Net increase (decrease) in cash, cash equivalents and restricted cash	(29,320)	(90,276)	159,697
Cash, cash equivalents and restricted cash			
Beginning of period	116,216	206,492	46,795
End of period	$86,896	$116,216	$206,492

Supplemental disclosures:			
Purchases of property and equipment included in accounts payable and accrued liabilities	$8	$503	$347

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

Alder BioPharmaceuticals, Inc.

Notes to Consolidated Financial Statements

1. Nature of Business

Alder BioPharmaceuticals, Inc. (the "Company") is a clinical-stage biopharmaceutical company that discovers, develops and seeks to commercialize therapeutic antibodies with the potential to meaningfully transform current treatment paradigms. The Company has developed a proprietary antibody platform designed to select and manufacture antibodies that have the potential to maximize efficacy as well as speed of onset and durability of therapeutic response. The Company was incorporated in Delaware on May 20, 2002 and is located in Bothell, Washington.

Liquidity and Going Concern

The Company has an accumulated deficit as of December 31, 2017. To date, the Company has funded its operations primarily through sales of its capital stock and payments from its former collaboration partners, and will require substantial additional capital for research and product development. As described further in Note 18 – Subsequent events, in January 2018, the Company completed a private placement of 725,268 shares of convertible preferred stock resulting in net proceeds of approximately $97.7 million. In February 2018, the Company received approximately $277.7 million in net proceeds from an underwritten public offering of 2.5% convertible senior notes due 2025 (the "Notes").

The Company forecasts a significant increase in expenditures to support the planned Biologics License Application submission, commercial readiness activities and anticipated commercial launch of eptinezumab. The Company estimates the available cash, cash equivalents, short-term investments and restricted cash as of December 31, 2017, together with the proceeds received from the January 2018 private placement of convertible preferred stock and the February 2018 Notes offering will be sufficient to achieve a U.S. commercial launch of eptinezumab on its expected schedule, assuming regulatory approval, and meet our projected operating requirements into 2020. The Company has based its estimate on the timing for its projected expenditures on assumptions that may prove to be wrong, and it could utilize its available capital resources sooner than it currently expects. Furthermore, the Company's operating plans may change, and it may need additional funds to meet operational needs and capital requirements for product development and commercialization of eptinezumab sooner than planned. The Company will also need to obtain substantial additional sources of funding to develop and commercialize ALD1910 and its other product candidates. The Company expects to finance future cash needs through equity financings, debt financings, collaborations, strategic alliances, licensing arrangements and other marketing and distribution arrangements, but there are no assurances that the Company will be able to raise sufficient amounts of funding in the future on acceptable terms, or at all.

The consolidated financial statements have been prepared assuming that the Company will continue as a going concern, which contemplates continuity of operations, the realization of assets and the satisfaction of liabilities and

commitments in the normal course of business.

2. Summary of Significant Accounting Policies

Principles of Consolidation

The accompanying consolidated financial statements reflect the accounts of Alder BioPharmaceuticals, Inc. and its wholly owned subsidiaries, Alder BioPharmaceuticals Pty. Ltd., AlderBio Holdings LLC, and Alder BioPharmaceuticals Limited. All inter-company balances and transactions have been eliminated in consolidation. The consolidated financial statements have been prepared in conformity with United States generally accepted accounting principles ("U.S. GAAP").

The Company has a relationship with a variable interest entity ("VIE"). The Company evaluates VIEs to determine whether the Company is the primary beneficiary by performing a qualitative and quantitative analysis of each VIE that includes a review of, among other factors, the VIE's capital structure, contractual terms, related party relationships, the Company's fee arrangements and the design of the VIE. This analysis includes determining whether the Company (1) has the power to direct matters that most significantly impact the activities of the VIE, and (2) has the obligation to absorb losses or the right to receive benefits of the VIE that could potentially be significant to the VIE.

In circumstances where the Company is not the primary beneficiary, but the Company has the ability to exercise significant influence over the operating and financial policies of a company in which it has an investment, the Company utilizes the equity method of accounting for recording investment activity. In assessing whether the Company exercises significant influence, it considers the nature and magnitude of the investment, the voting and protective rights held, any participation in the governance of the other company, and other relevant factors such as the presence of a collaboration or other business relationship. Under the equity method of accounting, the Company records in its results of operations its share of income or loss of the other company. If the Company's share

of losses exceeds the carrying value of its investment, it will suspend recognizing additional losses and will continue to do so unless the Company commits to providing additional funding. The Company monitors its investment to evaluate whether any decline in value has occurred that would be other-than-temporary, based on the implied value of recent company financings, public market prices of comparable companies, and general market conditions. The carrying value of the investment is included in the Company's consolidated balance sheet as investment in unconsolidated entity.

Use of Estimates

The preparation of consolidated financial statements in conformity with U.S. GAAP requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and the disclosure of contingent assets and liabilities at the date of the financial statements and the reported amounts of revenues and expenses during the reporting period. Actual results could differ from those estimates.

Foreign Currency Translation

The functional currency of the Company's subsidiaries is the U.S. dollar and all assets and liabilities of the subsidiaries are translated using year-end exchange rates and revenues and expenses are translated at average exchange rates for the year. Translation adjustments are reflected in foreign currency gain (loss) in the consolidated statements of operations.

Cash and Cash Equivalents

The Company considers all highly liquid investments purchased with original maturities less than 90 days to be cash equivalents. Cash and cash equivalents consist primarily of money market funds and are stated at cost, which approximates fair value.

Investments

Investments consist of negotiable certificates of deposit and U.S. government agency obligations. The Company classifies its securities as available-for-sale, which are reported at estimated fair value with unrealized gains and losses included in accumulated other comprehensive income (loss) in stockholders' equity. Investments in securities with maturities of less than one year, or where management's intent is to use the investments to fund current operations, or

to make them available for current operations, are classified as short-term investments.

Realized gains and realized losses are included in interest income. Cost of investments for purposes of computing realized and unrealized gains and losses are based on the specific identification method. Interest and dividends earned on all securities are included in interest income.

Restricted Cash

The Company had restricted cash of $10 million as of December 31, 2017, classified as a non-current asset on the consolidated balance sheets. The funds are placed in an escrow account pursuant to a contractual agreement with a third-party manufacturer and will be used for payments under that agreement in 2019.

Concentration of Credit Risk

The Company is exposed to credit risk from its deposits of cash and cash equivalents and restricted cash in excess of amounts insured by the Federal Deposit Insurance Corporation.

The Company had one collaborator which accounted for 100% of total revenues for the years ended December 31, 2017 and 2016. The Company had no revenue for the year ended December 31, 2015.

Fair Value of Financial Instruments

The Company holds financial instruments that are measured at fair value which is determined according to a fair value hierarchy that prioritizes the inputs and assumptions used, and the valuation techniques used to measure fair value. The three levels of the fair value hierarchy are described as follows:

Level 1 Inputs are unadjusted quoted prices in active markets for identical assets or liabilities.

Level 2 Inputs are quoted prices for similar assets and liabilities in active markets or quoted prices for identical or similar instruments in markets that are not active and model-derived valuations in which all significant inputs and significant value drivers are observable in active markets.

Level 3 Inputs are unobservable inputs based on the Company's assumptions and valuation techniques used to measure assets and liabilities at fair value. The inputs require significant management judgment or estimation.

The Company's assessment of the significance of a particular input to the fair value measurement requires judgment and may affect the valuation of fair value assets and liabilities and their placement within the fair value hierarchy levels.

The Company established the fair value of its assets and liabilities using the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date and established a fair value hierarchy based on the inputs used to measure fair value.

Property and Equipment

Property and equipment consists of laboratory equipment, computer equipment and software, leasehold improvements, and furniture and fixtures. Property and equipment are stated at cost, net of accumulated depreciation and amortization. Depreciation and amortization are computed using the straight-line method over the estimated useful lives of the depreciable assets.

Computer equipment and software	3 - 5 years
Laboratory equipment	4 years
Furniture and fixtures	5 years
Leasehold improvements	Shorter of asset's useful life or remaining term of lease

Upon retirement or sale, the cost of assets disposed of and the related accumulated depreciation are removed from the accounts and any resulting gain or loss is reflected in the statements of operations in the year of disposition. Additions and improvements that increase the value or extend the life of an asset are capitalized. Repairs and maintenance costs are expensed as incurred.

Rent Expense, Deferred Rent and Leasehold Improvements

Rent expense for leases that provide free rent periods and scheduled rent increases during the lease term is recognized on a straight-line basis over the term of the related lease. Leasehold improvements that are funded by landlord incentives or allowances under operating leases are recorded as a component of deferred rent and are amortized as a reduction of rent expense over the term of the related lease.

Impairment of Long-Lived Assets

The Company evaluates the recoverability of long-lived assets in accordance with authoritative guidance on accounting for the impairment or disposal of long-lived assets. The Company evaluates long-lived assets for impairment whenever events or changes in circumstances indicate that the carrying value of these assets may not be recoverable. Such impairment is recognized in the event the net book value of such assets exceeds their fair value. If the carrying value of the net assets assigned exceeds the fair value of the assets, then the second step of the impairment test is performed in order to determine the implied fair value. No impairment of long-lived assets occurred in the periods presented.

Segment and Geographic Information

Operating segments are identified as components of an enterprise about which separate discrete financial information is available for evaluation by the chief operating decision makers, or decision-making group, in making decisions on how to allocate resources and assess performance. The Company’s chief operating decision makers are its chief executive officer and its board of directors. The Company manages its business as one operating segment; however, the Company operates in three geographic regions: United States (Bothell, WA), Australia, and Ireland. Substantially all of the Company’s assets are located in, and revenues are generated in, the United States.

Revenue Recognition

The Company recognizes revenues from collaboration, license or research service contract arrangements when persuasive evidence of an arrangement exists, delivery has occurred or services have been rendered, the price is fixed or determinable and collectability is reasonably assured.

The Company evaluates multiple-element arrangements to determine (1) the deliverables included in the arrangement and (2) whether the individual deliverables represent separate units of accounting or whether they must be accounted for as a single unit of accounting. This evaluation involves subjective determinations and requires the Company to make judgments about the individual deliverables and whether such deliverables are separable from the other aspects of the contractual relationship. Deliverables are considered separate units of accounting provided that the delivered item has value to the customer on a standalone basis, and if the arrangement includes a general right of return with respect to the delivered item, delivery or performance of the undelivered item is considered probable and substantially in the Company's control. In assessing whether an item has standalone value, the Company considers factors such as the research, development, manufacturing and commercialization capabilities of the collaboration partner and the availability of the associated expertise in the general marketplace. In addition, the Company considers whether the collaboration partner can use any other deliverable for its intended purpose without the receipt of the remaining deliverable, whether the value of the deliverable is dependent on the undelivered item and whether there are other vendors that can provide the undelivered items. For sales of drug supply inventory at cost, the revenue is recognized upon transfer of the inventory. For revenue arrangements entered into prior to January 1, 2011, the Company was also required to evaluate whether there was fair value of the undelivered elements in the arrangement. The deliverables under the 2009 Bristol-Myers Squibb ("BMS") collaboration agreement did not qualify as separate units of accounting and accordingly are accounted for as a single unit of accounting.

The consideration received under an arrangement which contains separate units of accounting, is allocated among the separate units using the relative selling price method. The Company determines 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.

When the Company has substantive performance obligations under an arrangement accounted for as one unit of accounting, revenues are recognized using either a time-based or proportional performance-based approach. When the Company cannot estimate the total amount of performance obligations that are to be provided under the arrangement, a time-based method is used. Under the time-based method, revenues are recognized over the arrangement's estimated performance period based on the elapsed time compared to the total estimated performance period. When the Company is able to estimate the total amount of performance obligations under the arrangement, revenues are recognized using a proportional performance model. Under this approach, revenue recognition is based on costs incurred to date compared to total expected costs to be incurred over the performance period as this is considered to be representative of the delivery of service under the arrangement. Changes in estimates of total expected performance costs or service obligation time period are accounted for prospectively as a change in estimate. Under both methods, revenues recognized at any point in time are limited to the amount of noncontingent payments received or due.

The Company may also perform research and development activities on behalf of collaborative partners that are paid for by the collaborators. For research and development activities which are not determined to be separate units of accounting based on the criteria above, revenues for these research and development activities are recognized using the single unit of accounting method for that collaborative arrangement. For research and development activities which are determined to be separate units of accounting, arrangement consideration is allocated and revenues are recognized as services are delivered, assuming the general criteria for revenue recognition noted above have been met. The corresponding research and development costs incurred under these contracts are included in research and development expense in the consolidated statements of operations.

The Company generally invoices its collaborators upon the completion of the effort, based on the terms of each agreement. Amounts earned, but not yet collected from the collaborators, if any, are included in accounts receivable in the accompanying consolidated balance sheets. Deferred revenue arises from payments received in advance of the culmination of the earnings process. Deferred revenue expected to be recognized within the next 12 months is classified as a current liability. Deferred revenue will be recognized as revenue in future periods when the applicable revenue recognition criteria have been met.

Research and Development

Research and development expenses consist primarily of salaries and benefits, stock-based compensation, occupancy, materials and supplies, contracted research, consulting arrangements and other expenses incurred to sustain the Company’s research and development programs. Research and development costs are expensed as incurred. In-licensing fees and other costs to acquire

technologies that are utilized in research and development and that are not expected to have alternative future use are expensed when incurred. For service contracts entered into that include a nonrefundable prepayment for service the upfront payment is deferred and recognized in the consolidated statements of operations as the services are rendered.

Accrued Expenses

The preparation of the consolidated financial statements requires management to estimate and accrue expenses, the largest of which are research and development expenses. Costs for certain development activities are recognized based on an evaluation of the progress to completion of specific tasks using information and data provided by vendors and clinical sites. The Company bases its expense accruals related to clinical trials on its estimates of the services received and efforts expended pursuant to contracts with clinical research organizations that conduct and manage clinical trials on our behalf. Actual expenses could differ from the Company's estimates. To date, the Company has not experienced significant changes in its estimates of accrued research and development expenses after a reporting period.

Patent Costs

Costs related to filing and pursuing patent applications are expensed as incurred, as recoverability of such expenditures is uncertain. These patent-related legal costs are reported as a component of general and administrative expenses.

Income Taxes

The Company accounts for income taxes under the asset and liability method. Under the asset and liability method, deferred income tax assets and liabilities are recognized for the future tax consequences attributable to the differences between the financial statement carrying amounts of existing assets and liabilities and their respective tax basis and are measured using the tax income rates that will be in effect when the differences are expected to reverse. A valuation allowance is recorded when it is more likely than not that some of the net deferred income tax asset will not be realized.

The Company determines whether a tax position is more likely than not to be sustained upon examination based on the technical merits of the position. For tax positions meeting the more-likely-than-not threshold, the tax amount recognized in the financial statements is reduced by the largest benefit that has a greater than 50% likelihood of being realized upon ultimate settlement with the relevant tax authority.

Stock-Based Compensation

The Company recognizes stock-based compensation expense on stock awards granted to employees and members of the board of directors based on their estimated grant date fair value using the Black-Scholes option pricing model. This Black-Scholes option pricing model uses various inputs to measure fair value, including estimated market value of the Company's underlying common stock at the grant date, expected term, estimated volatility, risk-free interest rate and expected dividend yields of the Company's common stock. The Company recognizes stock-based compensation expense, net of estimated forfeitures, in the consolidated statements of operations on a straight-line basis over the requisite service period. The Company applies an estimated forfeiture rate derived from historical and expected future employee termination behavior. If the actual number of forfeitures differs from those estimated by management, adjustments to compensation expense may be required in future periods.

For stock options granted to non-employees, the fair value of the stock options is estimated using the Black-Scholes option pricing model. This model utilizes the estimated market value of the Company's underlying common stock at the measurement date, the contractual term of the option, estimated volatility, risk-free interest rates and expected dividend yields of the Company's common stock. The Company recognizes stock-based compensation expense, net of estimated forfeitures, in the consolidated statements of operations on a straight-line basis over the requisite service period. Measurement of stock-based compensation is subject to periodic adjustment for changes in the fair value of the award.

Comprehensive Income (Loss)

Comprehensive income (loss) is defined as the change in equity of a business enterprise during a period from transactions, and other events and circumstances from non-owner sources, and currently consists of net income (loss), changes in unrealized gains and losses on available-for-sale securities and gains and losses on foreign currency translation.

Recent Accounting Pronouncements

In May 2014, the Financial Accounting Standards Board ("FASB") issued Accounting Standards Update (ASU) No. 2014-09, Revenue from Contracts with Customers (Topic 606), which will replace most existing revenue recognition guidance in U.S. GAAP when it becomes effective. This ASU stipulates that an entity should recognize revenue to depict the transfer of promised goods or services to customers in an amount that reflects the consideration to which the entity expects to be entitled in exchange for those goods or services. The ASU also requires additional disclosure about the nature, amount, timing and uncertainty of revenue and cash flows arising from customer contracts, including significant judgments and changes in judgments and assets recognized from costs incurred to obtain or fulfill a contract. In March 2016, the FASB issued ASU 2016-08, Principal versus Agent Considerations (Reporting Revenue Gross versus Net). This ASU clarifies the implementation guidance on principal versus agent considerations. In April 2016, the FASB issued ASU 2016-10, Identifying Performance Obligations and Licensing. This ASU clarifies two aspects of ASU 2014-09, Revenue from Contracts with Customers (Topic 606): identifying performance obligations and the licensing implementation guidance. In May 2016, the FASB issued ASU 2016-12, Narrow-Scope Improvements and Practical Expedients. This ASU addresses certain issues in ASU 2014-09, Revenue from Contracts with Customers (Topic 606) regarding assessing collectability, presentation of sales taxes, noncash consideration, and completed contracts and contract modifications at transition. In December 2016, the FASB issued ASU 2016-20, Technical Corrections and Improvements to Topic 606, Revenue from Contracts with Customers. This ASU amends narrow aspects of ASU 2014-09, Revenue from Contracts with Customers.

The new revenue standards are effective for annual reporting periods beginning after December 15, 2017, including interim periods within that reporting period. Early adoption is permitted for annual reporting periods beginning after the original effective date of December 15, 2016. The standards permit the use of either the full retrospective or modified retrospective method. The Company does not believe adopting this guidance will have a material impact on its financial statements as the Company is not currently generating material revenues.

In January 2016, the FASB issued ASU 2016-01, Financial Instruments-Overall. This ASU addresses certain aspects of recognition, measurement, presentation, and disclosure of financial instruments. This ASU will become effective for annual periods beginning after December 15, 2017. The Company is currently evaluating the impact of the adoption of this ASU on its consolidated financial statements.

In February 2016, the FASB issued ASU 2016-02, Leases. This ASU requires the recognition of lease assets and lease liabilities on the balance sheet and disclosure of key information about leasing arrangements. This ASU will become effective for annual periods beginning after December 15, 2018. The Company expects adopting this guidance will result in an increase in the assets and liabilities on its consolidated balance sheets and will have some impact on its consolidated statements of operations and statement of cash flows.

In August 2016, the FASB issued ASU 2016-15, Statement of Cash Flows – Classification of Certain Cash Receipts and Cash Payments. This ASU addresses eight specific cash flow issues with the objective of reducing the existing diversity in practice. This ASU will become effective for annual periods beginning after December 15, 2017. The Company does not believe adopting this guidance will have a material impact as it relates to the treatment of equity distributions which are currently not material to the Company.

In November 2016, the FASB issued ASU 2016-18, Statement of Cash Flows – Restricted Cash, which provides amendments to current guidance to address the classification and presentation of changes in restricted cash in the consolidated statement of cash flows. This ASU requires that a statement of cash flows explain the change during the period in the total cash, cash equivalents, and amounts generally described as restricted cash or restricted cash

equivalents. This ASU will become effective for annual periods beginning after December 15, 2017. Early adoption is permitted and is required to be applied retrospectively. The Company early adopted this ASU and retrospectively applied the change to the consolidated statement of cash flows for the year ended December 31, 2017. Upon the adoption, amounts described as restricted cash are now included with cash and cash equivalents when reconciling the beginning-of-period and end-of-period amounts shown on the consolidated statements of cash flows.

In May 2017, the FASB issued ASU 2017-09, Compensation-Stock Compensation (Topic 718) – Scope of Modification Accounting. This ASU provides guidance about which changes to the terms or conditions of a share-based payment award require an entity to apply modification accounting in Topic 718. This ASU will become effective for annual periods beginning after December 15, 2017. The Company will apply this accounting guidance to any stock award modifications which occur in future periods.

The Company has reviewed other recent accounting pronouncements and concluded that they are either not applicable to the business, or that no material effect is expected on the consolidated financial statements as a result of future adoption.

3. Net Loss Per Share

Basic net loss per share is calculated by dividing net loss by the weighted average common shares outstanding during the period, without consideration for common stock equivalents. Diluted net loss per share is calculated by adjusting the weighted average common shares outstanding for the dilutive effect of common stock equivalents outstanding for the period, determined using the treasury-stock method.

	Years Ended December 31,		
	2017	2016	2015
Net loss (in thousands)	$(288,879)	$(156,254)	$(85,470)
Denominator			
Weighted average common shares outstanding - basic and diluted	58,347,284	48,407,565	40,586,980
Net loss per share - basic and diluted	$(4.95)	$(3.23)	$(2.11)

The following weighted average numbers of shares of outstanding stock options and awards under the employee stock purchase plan were excluded from the calculation of diluted net loss per share for 2017, 2016 and 2015 because including them would have had an anti-dilutive effect.

	Years Ended December 31,		
	2017	2016	2015
Stock options	6,673,285	4,350,900	2,890,409
Employee stock purchase plan	229,958	102,485	114,937
	6,903,243	4,453,385	3,005,346

4. Restricted Cash

The Company had restricted cash of $10 million as of December 31, 2017, classified as a non-current asset on the consolidated balance sheets. The funds are placed in an escrow account pursuant to a contractual agreement with a third-party manufacturer and will be used for payments under that agreement in 2019.

The following table provides a reconciliation of cash, cash equivalents, and restricted cash reported within the consolidated balance sheets to the total of cash, cash equivalents and restricted cash shown in the consolidated statements of cash flows.

	Years Ended December 31,	
	2017	2016
	(in thousands)	
Cash and cash equivalents	$76,896	$116,216
Restricted cash	10,000	—
Total cash, cash equivalents, and restricted cash shown in the consolidated statements of cash flows	$86,896	$116,216

5. Fair Value Disclosures

The following table presents the Company's financial instruments by level within the fair value hierarchy:

	Fair Value Measurement Using			
	Level 1	Level 2	Level 3	Total
	(in thousands)			
As of December 31, 2017				
Cash equivalents				
Money market funds	$71,379	$—	$ —	$71,379
Short-term investments				
U.S. government agency obligations	—	199,344	—	199,344
Restricted cash				
Money market funds	10,000	—	—	10,000
	$81,379	$199,344	$ —	$280,723
As of December 31, 2016				
Cash equivalents				
Money market funds	$111,149	$—	$ —	$111,149
Short-term investments				
Negotiable certificates of deposit	—	10,997	—	10,997
U.S. government agency obligations	—	224,654	—	224,654
	$111,149	$235,651	$ —	$346,800

The Company's negotiable certificates of deposit and U.S. government agency obligations are valued using fair value measurements that are considered to be Level 2. The investment custodian provides the Company with valuations of its securities portfolio. The primary source for the security valuation is Interactive Data Corporation ("IDC"), which evaluates securities based on market data. IDC utilizes evaluated pricing models that vary by asset class and include available trade, bid, and other market information. Generally, the methodology includes broker quotes, proprietary models, vast descriptive terms and conditions databases, as well as extensive quality control programs. The custodian utilizes proprietary valuation matrices for valuing all negotiable certificates of deposit.

Accounts payable and accrued liabilities are carried at cost, which approximates fair value due to the short-term nature of these financial instruments.

6. Investments

Short-term investments consisted of the following securities available-for-sale for the date indicated:

	Amortized Cost	Gross unrealized gains	Gross unrealized losses	Fair Value
	(in thousands)			
Type of security as of December 31, 2017				
U.S. government agency obligations maturing in				
one year or less	$199,434	$ —	$ (90)	$199,344
Total available-for-sale securities	$199,434	$ —	$ (90)	$199,344
Type of security as of December 31, 2016				
Negotiable certificates of deposit maturing in				
one year or less	$11,000	$ 1	$ (4)	$10,997
U.S. government agency obligations maturing in				
one year or less	224,697	27	(70)	224,654
Total available-for-sale securities	$235,697	$ 28	$ (74)	$235,651

All short-term investments had a contractual maturity of one year or less.

The decreases in value of these investments are primarily related to changes in interest rates and are considered to be temporary in nature. The Company evaluates, among other things, the duration and extent to which the fair value of a security is less than its cost, the financial condition of the issuer, and the intent to sell, or whether it is more likely than not that the Company will be required to sell the security before recovery of the amortized cost basis. The Company's realized gains and realized losses on sales of available-for-sale securities were not significant for the years ended December 31, 2017, 2016 and 2015. No securities have been in a continuous unrealized loss position for more than 12 months as of December 31, 2017.

7. Prepaid Expenses and Other Assets

Prepaid expenses and other assets consisted of the following for the dates indicated:

	December 31,	
	2017	2016
	(in thousands)	
Current assets:		
Advance payments for research and development	$9,200	$39,274
Prepaid insurance, other prepaid general and administrative expenses and other assets	1,814	1,106
	$11,014	$40,380
Long-term assets:		
Advance payments for research and development	$—	$8,000
Other long-term assets	30	30
	$30	$8,030

Long-term assets in 2016 included a refundable $8.0 million reservation fee paid to a third party to secure additional production capacity. Upon execution of a binding agreement in March 2017, this payment was characterized as a non-refundable payment and recognized as research and development expense during the first quarter ended March 31, 2017.

8. Property and Equipment

Property and equipment consisted of the following for the dates indicated:

	December 31,	
	2017	2016
	(in thousands)	
Computer equipment and software	$830	$1,098
Laboratory equipment	4,131	6,858
Furniture and fixtures	1,031	1,167
Leasehold improvements	4,914	5,269

	10,906	14,392
Less: Accumulated depreciation and amortization	(5,276)	(7,316)
	$5,630	$7,076

Depreciation and amortization expense totaled $3.0 million, $1.7 million, and $0.8 million for the years ended December 31, 2017, 2016 and 2015, respectively.

9. Investment in Unconsolidated Entity and Inventory

In May 2016, the Company licensed the exclusive worldwide rights to its product candidate clazakizumab to Vitaeris, Inc. (“Vitaeris”), a newly formed company based in Vancouver, British Columbia. In exchange for the rights to clazakizumab, the Company received an equity interest in Vitaeris and is eligible to receive royalties and certain other payments. In addition, Randall C. Schatzman, Ph.D., the Company’s president and chief executive officer, joined Vitaeris’ board of directors. Since clazakizumab was developed internally by the Company, all previous expenditures to develop the compound were recognized as expense in the period incurred and there was no carrying value on the Company’s consolidated balance sheet. In 2016, the Company recognized a gain on the license agreement of $1.1 million, which was determined as the fair value of the Company’s equity stake in Vitaeris. The Company recognized $1.6 million and $0.1 million in revenue and cost of sales for the years ended December 31, 2017 and 2016, respectively, related to the sale of drug supply inventory of clazakizumab to Vitaeris at cost.

As of December 31, 2016, the Company had $0.9 million in inventory of finished goods for resale associated with the Vitaeris agreement on its consolidated balance sheet. This inventory was sold to Vitaeris in 2017. The Company values inventory at the lower

of cost or market value which is determined using the specific identification basis. Inventory is reduced to net realizable value for excess, obsolete or unsalable inventory.

Vitaeris is a VIE for which the Company is not the primary beneficiary as the Company does not have the power to direct the activities that most significantly influence the economic performance of the entity. In addition to the Company's exchange of license rights for clazakizumab, Vitaeris was capitalized through cash investments by other parties. The investment in Vitaeris is accounted for under the equity method of accounting because the Company holds common stock of Vitaeris and has significant influence over the operating and financial policies of Vitaeris through its ownership, license arrangement and representation on the board of directors. Therefore, the Company records its share of any loss or income generated by Vitaeris, which is recorded on a three-month lag, within the consolidated statement of operations. The investment is reflected as an investment in unconsolidated entity on the Company's consolidated balance sheet which represents the investment in Vitaeris, net of the Company's portion of any generated loss or income.

In November 2017, the Company and Vitaeris amended the license agreement for clazakizumab and Vitaeris and its shareholders, including the Company, entered into a strategic collaboration and purchase option agreement (the "option agreement") with a third party, CSL Limited, (CSL), an Australian entity, to expedite the development of clazakizumab as a therapeutic option for solid organ transplant rejection. Pursuant to the option agreement, CSL will provide research funding to Vitaeris for the development of clazakizumab and CSL received an exclusive option to acquire Vitaeris, subject to certain terms and conditions. Upon the execution of the option agreement, Vitaeris received an upfront payment of $15 million and Vitaeris will also receive future development milestone payments. If CSL exercises its purchase option, it will be required to make to Vitaeris' shareholders, including the Company, an immediate one-time payment and thereafter certain sales-based milestone payments. The Company will continue to be eligible to receive royalties and certain other payments following an acquisition of Vitaeris by CSL. The Company recorded $0.6 million and $0.2 million in net loss with respect to Vitaeris for the years ended December 31, 2017 and 2016, respectively. This net loss reduced the Company's carrying value of the Company's investment in Vitaeris to $0.2 million and $0.9 million which is classified as a non-current asset as of December 31, 2017 and 2016, respectively. The purchase option created a written call on the Company's shares in Vitaeris and the value of this written call is not significant. The Company has no implied or unfunded commitments related to Vitaeris and its maximum exposure to loss is limited to the current carrying value of the investment.

10. Accrued Liabilities

Accrued liabilities consisted of the following for the dates indicated:

	December 31,	
	2017	2016
	(in thousands)	
Compensation and benefits	$7,933	$4,833
Contracted research and development	6,846	9,837
Professional services and other	1,024	767
	$15,803	$15,437

11. Collaboration and License Agreements

In 2017 and 2016, the Company recognized revenue under its agreement with Vitaeris in accordance with the Company's revenue recognition policy. The Company did not recognize any revenue in 2015.

	Years Ended December 31,		
	2017	2016	2015
	(in thousands)		
Revenues recognized:			
Collaboration and license agreements	$1,619	$113	$ —
Total revenues recognized	$1,619	$113	$ —

12. Capital Stock

There were 67,842,942 and 50,368,206 shares of common stock issued and outstanding as of December 31, 2017 and 2016, respectively. Under the Amended and Restated Certificate of Incorporation, the Company's authorized capital stock consists of

200,000,000 shares designated as common stock and 10,000,000 shares designated as preferred stock, all with a par value of $0.0001 per share. There were no shares of preferred stock issued and outstanding as of December 31, 2017.

The Company has reserved for future issuance the following number of shares of common stock:

	December 31, 2017
Stock options outstanding	7,286,834
Reserved for stock incentive plan	1,504,604
Reserved for employee stock purchase plan	1,183,862
	9,975,300

Common Stock

Each share of common stock is entitled to one vote. The holders of common stock are also entitled to receive dividends whenever funds are legally available and when declared by the board of directors, subject to the prior rights of holders of other classes of stock outstanding.

In January 2015, the Company completed an underwritten public offering of 6,900,000 shares of common stock, including 900,000 shares the Company issued pursuant to the underwriters' exercise of their option to purchase additional shares, for a total net proceeds of $190.7 million, after deducting underwriting discounts and commissions of $12.2 million and offering expenses of $0.6 million.

In June 2015, the Company completed an underwritten public offering of 5,168,539 shares of common stock, including 674,157 shares the Company issued pursuant to the underwriters' exercise of their option to purchase additional shares, for a total net proceeds of $215.9 million, after deducting underwriting discounts and commissions of $13.8 million and offering expenses of $0.3 million.

In April 2016, the Company completed an underwritten public offering of 6,182,795 shares of common stock, including 806,451 shares the Company issued pursuant to the underwriters' exercise of their option to purchase additional shares, for a total net proceeds of $134.9 million, after deducting underwriting discounts and commissions of $8.6 million and offering expenses of $0.3 million.

In July 2017, the Company completed an underwritten public offering of 17,250,000 shares of common stock, including 2,250,000 shares the Company issued pursuant to the underwriters' exercise of their option to purchase additional shares, for a total net proceeds of $161.5million, after deducting underwriting discounts and commissions of $10.4 million and offering expenses of $0.7 million.

13. Stock-based Compensation

2014 Equity Incentive Plan

In April 2014, the Company's stockholders approved the 2014 Equity Incentive Plan (the "2014 Plan"), which became effective in May 2014 at which time the 2005 Stock Plan (the "2005 Plan") was terminated. Until its termination, the 2005 Plan authorized the issuance of up to 2,661,818 shares of the Company's common stock pursuant to the exercise of stock options and other forms of equity compensation. The 2014 Plan authorizes the grant of stock options, other forms of equity compensation, and performance cash awards. The number of shares of common stock reserved for issuance under the 2014 Plan automatically increases on January 1 of each year, beginning on January 1, 2015 and ending on and including January 1, 2024, by 4% of the total number of shares of the Company's capital stock outstanding on December 31 of the preceding calendar year, or a lesser number of shares determined by the Company's board of directors. All options granted under both the 2005 Plan and the 2014 Plan have a maximum 10-year term and generally vest and become exercisable over four years of continued employment or service as defined in each option agreement. A majority of the unvested stock options will vest upon the sale of all or substantially all of the stock or assets of the Company. The board of directors determines the option exercise price and may designate stock options granted as either incentive or nonstatutory stock options. The Company generally grants stock options with exercise prices that equal or exceed the fair value of the common stock on the date of grant.

At December 31, 2017, options to purchase up to 7,286,834 shares of common stock were outstanding and1,504,604 shares were reserved for future grants under the 2014 Plan. On January 1, 2018, an additional 2,713,717 shares of common stock became available for future grants under the 2014 Plan.

Employee Stock Purchase Plan

In April 2014, the Company's stockholders approved the 2014 Employee Stock Purchase Plan (the "ESPP") which became effective in May 2014. Under the ESPP, eligible employees can authorize payroll deductions for amounts up to the lesser of 15% of their qualifying wages or the statutory limit under the U.S. Internal Revenue Code. The ESPP provides for offering periods of up to 27 months in duration. Each offering period is comprised of four consecutive purchase periods which begin on December 1 and June 1 of each year. Participants enrolled in an offering period will continue in that offering period until the earlier of the end of the offering period or the reset of the offering period. A reset occurs if the fair market value of the Company's common shares on any purchase date is less than it was on the first day of the offering period. Participants in an offering period will be granted the right to purchase common shares at a price per share that is 85% of the lesser of the fair market value of the shares at (i) the first day of the offering period or (ii) the end of each purchase period within the offering period. A maximum of 2,000 shares of common stock may be purchased by each participant at each of four purchase dates during the offering period. The fair value of the ESPP options granted is determined using a Black-Scholes model and is amortized on a straight-line basis. The number of shares reserved for the ESPP automatically increases each year, beginning on January 1, 2015 and continuing through and including January 1, 2024, by the lesser of (1) 1% of the total number of shares of common stock outstanding on December 31 of the preceding calendar year; (2) 750,000 shares of common stock; or (3) such lesser number as determined by the Company's board of directors. As of December 31, 2017, 1,183,862 shares of common stock were reserved for future grants under the ESPP. On January 1, 2018, an additional 678,429 shares of common stock became available for future grants under the ESPP.

Activity under the ESPP for the years ended December 31, was as follows:

Year	Purchase price	Number of Shares Purchased
2017	$ 9.35	65,231
	$ 13.09	48,584
		113,815
2016	$ 8.50	63,291
	$ 13.87	2,865
	$ 20.02	30,389
	$ 25.56	5,158
		101,703
2015	$ 8.50	89,440
	$ 13.87	2,540
	$ 36.14	1,253
		93,233

As of December 31, 2017, the total unrecognized compensation cost related to the ESPP was $2.1 million and will be recognized on a straight-line basis over the weighted average remaining service period of 1.1 years.

The Company uses the Black-Scholes option pricing model to estimate the fair value of stock awards using various assumptions that require management to apply judgment and make estimates, including:

Volatility

The expected volatility has been determined using a weighted average of the historical volatilities of a representative group of publicly traded biopharmaceutical companies for a period equal to the expected term of the option grant.

Expected Term

In determining the expected term of the Company's stock options, the Company takes into consideration the contractual term of 10 years, the multiple vesting tranches which generally vest in full over 4 years, and expectations of future employee behavior. The Company has estimated the expected term at 6.1 years which approximates the actual historical life of stock options which have been exercised or cancelled.

Risk-free Rate

The risk-free interest rates used in the Black-Scholes option pricing model are based on the implied yield currently available for U.S. Treasury securities with maturities similar to the expected term of the stock options being valued.

Dividends

The Company has not declared or paid any dividends and does not currently expect to do so in the foreseeable future, and therefore uses an expected dividend yield of zero in the Black-Scholes option pricing model.

In determining the fair value of stock awards granted, the following weighted average assumptions were used in the Black-Scholes option pricing model for awards granted in the periods indicated:

	Stock Options Years Ended December 31,			Employee Stock Purchase Plan Year Ended December 31,		
	2017	2016	2015	2017	2016	2015
Volatility	61.6%	60.5%	59.5%	66.8%	68.0%	57.0%
Expected term (years)	6.1	6.1	6.1	1.4	1.4	0.9
Risk-free interest rate	2.1%	1.4%	1.6%	1.5%	0.8%	0.3%
Dividend rate	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Stock-Based Compensation

The Company recognizes compensation expense for stock options granted to employees and directors for only the portion of awards expected to vest, on a straight-line basis over the requisite service period. Management has applied an estimated forfeiture rate that was derived from historical employee termination behavior. If the actual number of forfeitures differs from these estimates, additional adjustments to compensation expense may be required in future periods.

The Company records stock-based compensation for awards to non-employees using a fair value measured determined using the Black-Scholes option pricing model which reflects the same assumptions as applied to employee options in each of the reported periods, except for the expected term, for which it uses the remaining contractual life of the option. Stock-based compensation expense for non-employee awards is subject to remeasurement as the underlying equity instruments vest and is recognized as an expense over the period during which services are received. The Company did not have expenses relating to stock options granted to non-employees in 2017. In 2016 and 2015, the Company recognized $0.1 million and $0.3 million of expense, respectively, relating to stock options granted to non-employees.

The following table presents stock-based compensation expense included in the Company's consolidated statements of operations:

	Years Ended December 31,		
	2017	2016	2015
	(in thousands)		
Research and development	$12,629	$7,578	$3,449
General and administrative	9,869	6,379	2,690
	$22,498	$13,957	$6,139

As of December 31, 2017, the total unrecognized compensation cost relating to stock options was $45.8 million and will be recognized on a straight-line basis over the weighted average remaining service period of 2.6 years.

Stock option activity

A summary of the Company's stock option activity and related information follows:

	Shares	Weighted average exercise price per share	Weighted average remaining contractual life (years)	Aggregate intrinsic value (in thousands)
Options, Outstanding at beginning of period	4,918,052	$ 20.72	7.8	$ 23,098
Granted	2,552,825	19.20		
Exercised	(110,921)	1.71		
Forfeited and expired	(73,122)	27.75		
Options, Outstanding at end of period	7,286,834	$ 20.41	7.7	$ 8,665
Exercisable at December 31, 2017	3,136,714	$ 18.18	6.2	$ 8,347
Vested and expected to vest at December 31, 2017	7,201,653	$ 20.37	7.7	$ 8,661

The following table summarizes the Company's stock option values:

	Years Ended December 31,		
	2017	2016	2015
	(in thousands, except per share data)		
Weighted average fair value of option shares granted during the period	$11.14	$14.63	$17.43
Total intrinsic value of stock options exercised	1,624	10,179	20,389
Total fair value of stock options vested	20,712	9,207	2,133

14. Income Taxes

On December 22, 2017, the Tax Cuts and Jobs Act of 2017 (the "TCJA") was signed into law, making significant changes to the Internal Revenue Code. Key aspects include, but are not limited to, a decrease in the highest corporate

tax bracket from 35% to 21% effective for tax years beginning after December 31, 2017, the transition of the U.S international taxation from the existing worldwide tax system to a territorial system, and a one-time transition tax on previously deferred foreign earnings as of December 31, 2017. The Company has calculated the impact of the TCJA in accordance with its interpretation and guidance available as of the date of these financial statements. No additional income tax expense has been recorded in 2017 based on the use of existing net operating losses, or NOLs, to offset the additional income inclusion generated by the provisions of the TCJA.

Additionally, the TCJA restructured the existing NOL deduction and carryforward credit for companies with NOL deferred tax assets. Any NOLs generated in years after December 31, 2017 will now be allowed to be carried forward indefinitely, but will be limited to 80% of taxable income. The TCJA removes the carryback period on NOLs generated after 2017, however the 20-year carryfoward and 2-year carryback period still apply to existing NOLs generated through 2017.

Loss before income taxes consisted of the following:

	Years Ended December 31,		
	2017	2016	2015
	(in thousands)		
Domestic	$(288,860)	$(156,409)	$(85,595)
Foreign	(19)	155	125
Loss before income taxes	$(288,879)	$(156,254)	$(85,470)

The effective income tax rate of the Company's provision for income taxes differed from the federal statutory rate of 34% for 2015 through 2017 as follows:

	Years Ended December 31,		
	2017	2016	2015
Federal statutory income tax rate	34.0 %	34.0 %	34.0 %
Stock-based compensation	2.5 %	(1.0 %)	(1.0 %)
Research and development credits	1.4 %	2.4 %	2.4 %
Other	0.0 %	(0.1 %)	(0.1 %)
U.S. federal statutory rate change	(30.5%)	0.0 %	0.0 %
Change in valuation allowance	(7.4 %)	(35.3%)	(35.3%)
Effective tax rate	0.0 %	0.0 %	0.0 %

The Company's net deferred income tax assets and liabilities are as follows:

	December 31,	
	2017	2016
	(in thousands)	
Deferred income tax assets:		
Net operating loss carryforwards	$135,053	$119,810
Research and development credits	15,589	11,540
Other	7,502	5,443
Total deferred income tax assets	158,144	136,793
Less: Valuation allowance	(158,144)	(136,793)
Net deferred income tax assets	$—	$—

At December 31, 2017, the Company had U.S. net operating loss ("NOL") carryforwards of $643.1 million, which may be used to offset future taxable income. The Company adopted ASU 2016-09 "Compensation – Stock Compensation" during 2017, and therefore the $27.5 million of historical excess tax benefits associated with stock option exercises recorded directly to stockholder's equity were released from off-balance sheet tracking and added to the balance sheet as deferred tax assets. The NOL carryforwards expire from 2025 to 2037 if not utilized. In addition, the Company has U.S. research and development tax credit carryforwards of $17.9 million, which will expire from 2024 to 2037. The Company establishes reserves or reduces deferred tax assets to address potential uncertain tax positions that it believes could be challenged by taxing authorities even though the Company believes the positions it has taken are more likely than not to stand during a tax examination. The Company reviews the uncertain tax positions as changes in factors to law warrant adjustments to the potential liability for additional taxes. It is often difficult to predict the final outcome or timing of resolution of any particular tax matter. Various events, some of which cannot be predicted, such as clarification of tax law by administrative or judicial means, may occur and would require the Company to increase or decrease its uncertain tax positions and effective income tax rate.

The Company calculated $0.3 million of taxable income inclusion related to the mandatory deemed repatriation of all foreign earnings as of December 31, 2017 that was offset in its entirety by existing NOLs. Prior to 2017, the Company recorded a deferred tax liability related to unremitted foreign earnings. This deferred tax liability was reversed in 2017 after the deemed repatriation and the Company's assessment that any future earnings will be permanently invested overseas.

On December 22, 2017, Staff Accounting Bulletin No. 118 ("SAB 118") was issued to address the application of U.S. 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 Act. This standard will not have a material impact to the financial statements.

In certain circumstances, where there is a change in control, utilization of NOLs and tax credit carryforwards are subject to certain limitations under Section 382 and 383 of the Internal Revenue Code of 1986, as amended. A change in control is generally defined as a cumulative change of 50% or more in the ownership positions of certain stockholders during a rolling three-year period. The Company performed a Section 382 analysis through 2017 and determined that an ownership change occurred in 2015 and is applicable to NOLs and tax credits created through 2015. However, based on the analysis, the Company does not believe that the Section 382 annual limitation will impact the Company's ability to utilize the tax attributes that existed as of the date of the ownership change in a material manner. NOLs and tax credits created after 2015 are not subject to an ownership change. The Company

continues to monitor ownership changes for purposes of Section 382. If it is determined that Section 382 ownership changes have occurred subsequent to 2015, the NOLs and tax credit carryforwards may be subject to an additional limitation such that a portion may not be utilizable.

The Company records a valuation allowance to reduce deferred tax assets to the extent it believes more likely than not that a portion of such assets will not be realized. In making such determinations, the Company considers all available positive and negative evidence, including scheduled reversals of deferred tax liabilities, projected future taxable income, tax planning strategies, and the ability to carry back NOLs to prior years. Currently the Company believes that it is not more likely than not that it will realize its current and long-term deferred tax assets. Accordingly, a valuation allowance has been recorded against the full value of the deferred income tax assets. There was a release in the valuation allowance for the effect of the Federal statutory rate change on the deferreds, which adjusts the ending balances for the rate differential that will never be realized.

The table below summarizes changes in the deferred tax valuation allowance:

	Balance at Beginning of Year	Charged to Costs and Expenses	Write-offs	Balance at End of Year
	(in thousands)			
Deferred income tax valuation allowance:				
For year ended December 31, 2016	$81,676	$55,117	$ —	$136,793
For year ended December 31, 2017	136,793	109,600	88,249	158,144

The Company determines whether a tax position is more likely than not to be sustained upon examination based on the technical merits of the position in accordance with ASC 740. For tax positions meeting the more likely than not threshold, the tax amount recognized in the financial statements is reduced by the largest benefit that has a greater than 50% likelihood of being realized upon ultimate settlement with the relevant taxing authority.

The total balance of unrecognized gross tax benefits was as follows:

	Years Ended December 31,		
	2017	2016	2015
	(in thousands)		
Unrecognized tax benefits at beginning of year	$1,593	$952	$592
Additions based on tax positions taken in prior years	—	35	—
Additions based on tax positions taken in the current year	714	606	360
Unrecognized tax benefits at end of year	$2,307	$1,593	$952

In addition to any uncertain tax positions, it is the Company’s policy to recognize potential accrued interest and/or penalties related to such positions within income tax expense. For 2017, 2016 and 2015, the Company has not

recognized any liability related to uncertain tax positions and does not anticipate that the amount of existing unrecognized tax benefits will significantly change within the next 12 months.

The Company is subject to U.S. federal income tax audit for tax years after 2012. However, carryforward attributes that were generated prior to 2013 may still be adjusted by the taxing authority upon examination if the attributes have been or will be used in a future period. The Company is also subject to examination of foreign returns tax years 2014 to present as the statute of limitations is still open.

15. Defined Contribution Plan

The Company sponsors a defined contribution plan (the "401(k) Plan") for its full-time employees, with eligibility commencing on the month following an employee's date of hire. Employee contributions to the 401(k) Plan are based on a percentage of the employee's gross compensation, limited by Internal Revenue Service guidelines for such plans. The 401(k) Plan provides for matching and discretionary contributions by the Company, which were $1.2 million, $0.8 million, and $0.4 million for the years ended December 31, 2017, 2016 and 2015, respectively.

16. Commitments and Contingencies

The Company had contract manufacturing and purchase obligations totaling $228.5 million at December 31, 2017 related to manufacturing its product candidates for use in clinical trials, including long-term stability studies.

The Company leases office space in four adjacent buildings in Bothell, Washington, for its research and development and administrative activities. In November and December 2016, the Company and the landlords for three of the four buildings which constitute approximately 90% of the total square footage, entered into amendments to the leases under which, among other things, the lease terms were extended to July 31, 2023. Rent expense totaled $1.9 million, $1.6 million, and $0.8 million for years ended December 31, 2017, 2016 and 2015, respectively.

Future aggregate minimum payments under noncancelable operating leases as of the date indicated are as follows:

	December 31, 2017 (in thousands)
Years Ending December 31,	
2018	1,395
2019	1,434
2020	1,477
2021	1,521
2022	1,568
Thereafter	940
Total minimum lease payments	$ 8,335

In July 2014, the Company and Eli Lilly and company each filed an opposition to Labrys Biologics Inc.'s (now owned by Teva Pharmaceuticals International GmbH, or Teva GmbH) European Patent No. 1957106 B1, requesting that such patent be revoked in its entirety. In an oral proceeding held in Munich, Germany on November 18, 2016, the

Opposition Division, or OD, of the European Patent Office, or EPO, issued a ruling revoking all claims in the patent relating to CGRP antagonist antibodies and maintaining but narrowing claims directed to the use of CGRP antagonist antibodies in human therapy to the prevention or treatment of headache such as migraine and cluster headache. The written decision consistent with the oral ruling was issued in February 2017. The Company subsequently initiated an appeal of the decision. On January 5, 2018, the Company entered into a Settlement and License Agreement with Teva GmbH pursuant to which we received a non-exclusive license to Teva GmbH's CGRP patent portfolio, which includes the opposed European patent, to develop, manufacture and commercialize eptinezumab in the United States and worldwide, excluding Japan and Korea, and agreed to withdraw our appeal. While the agreement does not provide us with a license for Japan and Korea, we believe we have freedom to develop, manufacture and commercialize eptinezumab in these countries.

From time to time, the Company may become involved in litigation relating to claims arising from the ordinary course of business. Management believes that there are currently no claims or actions pending against the Company where the ultimate disposition could have a material adverse effect on the Company's results of operations, financial condition or cash flows.

17. Condensed Quarterly Financial Data (unaudited)

The following table contains selected unaudited financial data for each quarter of 2017 and 2016. The unaudited information should be read in conjunction with the Company's financial statements and related notes included elsewhere in this report. The Company believes that the following unaudited information reflects all normal recurring adjustments necessary for a fair presentation of the information for the periods presented. The operating results for any quarter are not necessarily indicative of results for any future period.

	Three months ended			
	March 31,	June 30,	September 30,	December 31,
	(in thousands, except per share data)			
2017				
Total revenues	$—	$683	$—	$936
Net loss	(100,328)	(74,629)	(59,565)	(54,357)
Net loss per share - basic and diluted	$(1.99)	$(1.48)	$(0.92)	$(0.80)
2016				
Total revenues	$—	$113	$—	$—
Net loss	(33,363)	(38,866)	(35,134)	(48,891)
Net loss per share - basic and diluted	$(0.76)	$(0.79)	$(0.70)	$(0.97)

18. Subsequent Events

Settlement and Licensing Agreement

In January 2018, the Company entered into a Settlement and License Agreement with Teva Pharmaceuticals International GmbH ("Teva GmbH"). Under the terms of the Settlement and License Agreement, the Company received a non-exclusive license to Teva's CGRP patent portfolio for the development, manufacturing and commercialization of eptinezumab in the U.S. and worldwide, excluding Japan and Korea. While the agreement does not provide the Company with a license for Japan and Korea, the Company believes it has freedom to develop, manufacture and commercialize eptinezumab in these countries.

Upon the execution of the agreement, the Company made an immediate one-time payment of $25 million. In addition, a second one-time payment of $25 million is payable upon the approval of a biologics license application for eptinezumab with the U.S. Food and Drug Administration or of an earlier equivalent filing with a regulatory authority elsewhere in the license territory in which Teva GmbH licensed patents exist, pay $75 million at each two sales-related milestones (at $1 billion and $2 billion in annual sales), and provide certain royalty payments on net sales at rates from 5% to 7% following the commercial launch of eptinezumab.

Preferred Stock Purchase Agreement

In January 2018, the Company entered into a Preferred Stock Purchase Agreement ("Purchase Agreement") with certain institutional and other accredited investors affiliated with or managed by Redmile Group, LLC ("Buyers"). Buyers hold more than 5% of our capital stock and therefore are considered a related party of the Company. The preferred stock is initially convertible into shares of the Company's common stock on a one-for-ten basis. Upon execution of the Purchase Agreement, the Company sold to the Buyers in a private placement 725,268 shares of convertible preferred stock at $137.88 per share for net proceeds of approximately $97.7 million, after deducting fees and applicable expenses. In addition, the convertible preferred stock has a 5.0% dividend per year, payable semi-annually in additional shares of convertible preferred stock and/or cash at the Company's option. In addition, pursuant to the Purchase Agreement, in the event a deemed liquidation event occurs within 24 months of the date of the Purchase Agreement, the Company will issue the Buyers a warrant to purchase an aggregate of 75,000 shares of convertible preferred stock at a purchase price per share equal to the initial purchase price (share number and exercise price each subject to adjustment for any reorganization, recapitalization, non-cash dividend, stock split, reverse stock split or other similar transaction). Our preferred stock purchase agreement and our right to sell an additional $150 million of convertible preferred stock terminated upon closing of the 2.5% convertible senior notes and no additional shares will be issued under the agreement, except in the event of warrants issued and exercised as a result of a deemed liquidation event.

Convertible Senior Notes

In February 2018, the Company received approximately $277.7 million in net proceeds from an underwritten public offering of 2.5% convertible senior notes (the "Notes"). The Purchase Agreement and the Company's right thereunder to sell to the Buyers an additional $150 million of convertible preferred stock terminated upon the closing of the Notes. The Notes bear cash interest at a rate of 2.5% per year payable semiannually in arrears on February 1 and August 1 of each year, commencing on August 1, 2018. The Notes will mature on February 1, 2025, unless earlier repurchased, redeemed or converted in accordance with their terms. The Notes will be convertible into cash, shares of the Company's common stock, or a combination of cash and shares, at the Company's election. The initial conversion rate of the Notes will be 49.3827 shares of common stock per $1,000 principal amount of Notes.

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

None.

Item 9A. Controls and Procedures

(a) Evaluation of disclosure controls and procedures. Our management, with the participation of our Chief Executive Officer and our Executive Vice President and Principal Accounting Officer, our principal financial officer, have evaluated our disclosure controls and procedures (as defined in Rule 13a-15(e) under the Securities Exchange Act of 1934, as amended) prior to the filing of this annual report. Based on that evaluation, they have concluded that, as of the end of the period covered by this annual report, our disclosure controls and procedures were, in design and operation, effective at a reasonable assurance level.

(b) Changes in internal control over financial reporting. There have not been any changes in our internal control over financial reporting during the quarter ended December 31, 2017 that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

(c) Management's Annual Report on Internal Control Over Financial Reporting. Our management is responsible for establishing and maintaining adequate internal control over financial reporting, as such term is defined in Rule 13a-15(f) under the Securities Exchange Act of 1934, as amended. Our management conducted an evaluation of the effectiveness of our internal control over financial reporting based on the 2013 framework in Internal Control—Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission. Based on its evaluation under the framework in Internal Control—Integrated Framework, our management concluded that our internal control over financial reporting was effective as of December 31, 2017.

The effectiveness of our internal control over financial reporting as of December 31, 2017 has been audited by PricewaterhouseCoopers LLP, an independent registered public accounting firm, as stated in their report which is included in Item 8 in this Annual Report on Form 10-K.

(d) Inherent limitation on the effectiveness of internal control. The effectiveness of any system of internal control over financial reporting, including ours, is subject to inherent limitations, including the exercise of judgment in designing, implementing, operating, and evaluating the controls and procedures, and the inability to eliminate misconduct completely. Accordingly, any system of internal control over financial reporting, including ours, no matter

how well designed and operated, can only provide reasonable, not absolute assurances. In addition, 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.

Item 9B. Other Information

Not applicable.

PART III

Item 10. Directors, Executive Officers and Corporate Governance

(1) The information required by this Item concerning our executive officers and our directors and nominees for director will be either included in an amendment to this Annual Report on Form 10-K or found under the section entitled “Proposal No. 1—Election of Directors,” “Information Regarding the Board of Directors and Corporate Governance,” and “Executive Officers” appearing in the 2018 Proxy Statement. Such information is incorporated herein by reference.

(2) The information required by this Item concerning our code of ethics will be either included in an amendment to this Annual Report on Form 10-K or found under the section entitled “Information Regarding the Board of Directors and Corporate Governance” appearing in the 2018 Proxy Statement. Such information is incorporated herein by reference.

(3) The information required by this Item concerning compliance with Section 16(a) of the Securities Exchange Act of 1934 will be either included an amendment to this Annual Report on Form 10-K or found in the section entitled “Section 16(a) Beneficial Ownership Reporting Compliance” appearing in the 2018 Proxy Statement. Such information is incorporated herein by reference.

Item 11. Executive Compensation

The information required by this Item will be either included in an amendment to this Annual Report on Form 10-K or found under the sections entitled “Director Compensation”, “Executive Compensation,” “Executive Compensation—Compensation Discussion and Analysis” and “Equity Compensation Plan Information” appearing in the 2018 Proxy Statement. Such information is incorporated herein by reference.

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

(1) The information required by this Item with respect to security ownership of certain beneficial owners and management will be either included in an amendment to this Annual Report on Form 10-K or found under the section entitled “Security Ownership of Certain Beneficial Owners and Management” appearing in the 2018 Proxy Statement. Such information is incorporated herein by reference.

(2) The information required by this Item with respect to securities authorized for issuance under our equity compensation plans will be either included in an amendment to this Annual Report on Form 10-K or found under the sections entitled “Equity Compensation Plan Information” appearing in the 2018 Proxy Statement. Such information is incorporated herein by reference.

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

(1) The information required by this Item concerning related party transactions will be either included in an amendment to this Annual Report on Form 10-K or found under the section entitled “Transactions with Related Persons” appearing in the 2018 Proxy Statement. Such information is incorporated herein by reference.

(2) The information required by this Item concerning director independence will be either included in an amendment to this Annual Report on Form 10-K or found under the sections entitled “Information Regarding the Board of Directors and Corporate Governance— Independence of the Board of Directors” and “Information Regarding the Board of Directors and Corporate Governance—Information Regarding Committees of the Board of Directors” appearing in the 2018 Proxy Statement. Such information is incorporated herein by reference.

Item 14. Principal Accountant Fees and Services

The information required by this Item will be either included in an amendment to this Annual Report on Form 10-K or found under the section entitled “Proposal No. 3—Ratification of Selection of Independent Registered Public Accounting Firm” appearing in the 2018 Proxy Statement. Such information is incorporated herein by reference.

PART IV

Item 15. Exhibits and Financial Statement Schedules

(a)(1) Financial Statements—The financial statements filed as part of this Annual Report on Form 10-K are listed on the Index to Consolidated Financial Statements in Item 8.

(a)(2) Financial Statement Schedules

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

(a)(3) Exhibits

The exhibits required by Item 601 of Regulation S-K are listed in paragraph (b) below.

(b) Exhibits

EXHIBIT INDEX

Exhibit		Incorporated by Reference				Filed
Number	Description	Form	File No.	Exhibit	Filing Date	Herewith
3.1	Amended and Restated Certificate of Incorporation.	8-K	001-36431	3.1	May 13, 2014	
3.2	Amended and Restated Bylaws.	S-1	333-194672	3.5	April 25, 2014	
3.3	Certificate of Designation of Preferences, Rights and Limitations of Class A-1 Convertible Preferred Stock of Alder BioPharmaceuticals, dated January 12, 2018	8-K	001-36431	3.1	January 19, 2018	
4.1	Amended and Restated Investors' Rights Agreement, dated as of April 16, 2012, by and among Alder BioPharmaceuticals, Inc. and certain of its stockholders.	S-1	333-194672	4.1	March 19, 2014	
4.2	Amendment No. 1 to Amended and Restated Investors' Rights Agreement, dated as of April 7, 2014, by and among Alder BioPharmaceuticals, Inc. and certain of its stockholders.	S-1	333-194672	4.2	April 25, 2014	
4.3	Form of Common Stock Certificate.	S-1	333-201201	4.3	December 22, 2014	
4.4	Registration Rights Agreement by and between Alder BioPharmaceuticals, Inc. and the buyers listed on the Schedule of Buyers thereto, dated January 12, 2018	8-K	001-36431	4.1	January 19, 2018	
4.5	Base Indenture, dated February 1, 2018, between the Company and U.S. Bank National Association, as Trustee	8-K	001-36431	4.1	February 1, 2018	
4.6	First Supplemental Indenture, dated February 1, 2018, between the Company and U.S. Bank National Association, as Trustee (including the form of 2.50% convertible senior notes due 2025)	8-K	001-36431	4.2	February 1, 2018	
10.1	Form of Indemnity Agreement between the Alder BioPharmaceuticals, Inc. and its directors and officers.	S-1	333-194672	10.1	April 25, 2014	
10.2+	2005 Stock Plan, as amended.	S-1	333-194672	10.2	March 19, 2014	
10.3+	Forms of Notice of Stock Option Grant, Stock Option Agreement and Exercise Notice and Restricted Stock Purchase Agreement for 2005 Stock Plan.	S-1	333-194672	10.3	March 19, 2014	
10.4+	2014 Equity Incentive Plan.	S-1	333-194672	10.4	April 25, 2014	
10.5+	Form of Stock Option Grant Notice and Option Agreement for the 2014 Equity Incentive Plan.	S-1	333-194672	10.5	April 25, 2014	

10.6+	2014 Employee Stock Purchase Plan.	S-1	333-194672	10.6	May 1, 2014
10.7+	Amended and Restated Executive Severance Benefit Plan.	10-K	001-36431	10.7	February 23, 2017
10.8+	Compensation Information for Non-Employee Directors	10-Q	001-36431	10.1	November 5, 2015
10.9	License Agreement by and between Alder BioPharmaceuticals, Inc. and the Keck Graduate Institute of Applied Life Sciences, dated October 15, 2004.	S-1	333-194672	10.11	May 1, 2014
10.10	Lease by and between Alder BioPharmaceuticals, Inc. and RREEF American REIT II Corp. KK, dated August 5, 2005.	S-1	333-194672	10.12	March 19, 2014
10.11	First Amendment to Lease by and between Alder BioPharmaceuticals, Inc. and RREEF American Reit II Corp. KK, dated February 1, 2008.	S-1	333-194672	10.13	March 19, 2014
10.12	Second Amendment to Lease by and between Alder BioPharmaceuticals, Inc. and KBS North Creek, LLC, as successor-in-interest to RREEF American REIT II Corp. KK, dated September 23, 2010.	S-1	333-194672	10.14	March 19, 2014

Exhibit		Incorporated by Reference				Filed
Number	Description	Form	File No.	Exhibit	Filing Date	Herewith
10.13	Third Amendment to Lease by and between Alder BioPharmaceuticals, Inc. and KBS North Creek, LLC, as successor-in-interest to RREEF American REIT II Corp. KK, dated August 21, 2013.	S-1	333-194672	10.15	March 19, 2014	
10.14	Fourth Amendment to Lease by and between Alder BioPharmaceuticals, Inc. and KBS North Creek, LLC, as successor-in-interest to RREEF American REIT II Corp. KK, dated November 12, 2015.	10-K	001-36431	10.17	February 23, 2016	
10.15	Fifth Amendment to Lease by and between KBS North Creek LLC, as successor-in-interest to RREEF American REIT II Corp. KK, and Alder Biopharmaceuticals, Inc. dated as of November 18, 2016.	8-K	001-36431	10.1	November 21, 2016	
10.16+	Amended and Restated Offer Letter by and between Alder BioPharmaceuticals, Inc. and Randall C. Schatzman, Ph.D. dated as of July 19, 2005.	S-1	333-194672	10.16	March 19, 2014	
10.17+	Amendment to Amended and Restated Offer Letter by and between Alder BioPharmaceuticals, Inc. and Randall C. Schatzman, Ph.D. dated as of April 13, 2012.	S-1	333-194672	10.17	March 19, 2014	
10.18+	Amended and Restated Offer Letter by and between Alder BioPharmaceuticals, Inc. and John A. Latham, Ph.D., dated as of July 19, 2005.	S-1	333-194672	10.18	March 19, 2014	
10.19+	Amendment to Amended and Restated Offer Letter by and between Alder BioPharmaceuticals, Inc. and John A. Latham, Ph.D., dated as of April 13, 2012.	S-1	333-194672	10.19	March 19, 2014	
10.20+	Amended and Restated Offer Letter by and between Alder BioPharmaceuticals, Inc. and Mark J. Litton, Ph.D., MBA, dated as of July 19, 2005.	S-1	333-194672	10.20	March 19, 2014	
10.21+	Amendment to Amended and Restated Offer Letter by and between Alder BioPharmaceuticals, Inc. and Mark J. Litton, Ph.D., MBA, dated as of April 13, 2012.	S-1	333-194672	10.21	March 19, 2014	
10.22+	Amended and Restated Offer Letter by and between Alder BioPharmaceuticals, Inc. and Jeffrey T.L. Smith, M.D., FRCP, dated as of July 19, 2005.	S-1	333-194672	10.22	March 19, 2014	
10.23+	Amendment to Amended and Restated Offer Letter by and between Alder BioPharmaceuticals, Inc. and Jeffrey T.L. Smith, M.D., FRCP, dated as of April 13, 2012.	S-1	333-194672	10.23	March 19, 2014	
10.24+	Offer Letter by and between Alder BioPharmaceuticals, Inc. and Timothy M. Whitaker, M.D., dated as of June 3, 2016.	10-K	001-36431	10.24	February 23, 2017	
10.25+		10-K	001-36431	10.25		

	Offer Letter by and between Alder BioPharmaceuticals, Inc. and Elisabeth A. Sandoval, dated as of July 26, 2016.				February 23, 2017	
10.26+	Separation and Consulting Agreement between Alder BioPharmaceuticals, Inc. and Timothy M. Whitaker, M.D., dated June 3, 2016.					X
10.27+	Amendment to Offer Letter between Alder BioPharmaceuticals, Inc., and Elisabeth A. Sandoval, dated January 2, 2018.					X
10.28†	Master Product Development and Clinical Supply Agreement by and between Alder BioPharmaceuticals, Inc. and Althea Technologies, Inc., dated March 21, 2011.	S-1	333-194672	10.24	May 1, 2014	
10.29	First Amendment to Master Product Development and Clinical Supply Agreement between Alder BioPharmaceuticals, Inc. and Althea Technologies, Inc., dated March 15, 2013	S-1	333-194672	10.25	May 1, 2014	
10.30	Preferred Stock Purchase Agreement by and among Alder BioPharmaceuticals, Inc. and the Buyers set forth therein dated January 7, 2018	8-K	001-36431	10.1	January 11, 2018	
21.1	List of subsidiaries of the Registrant.					X
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Exhibit		Incorporated by Reference				Filed
Number	Description	Form	File No.	Exhibit	Filing Date	Herewith
23.1	Consent of PricewaterhouseCoopers LLP, Independent Registered Public Accounting Firm.					X
31.1	Certification of Principal Executive Officer Required Under Rule 13a-14(a) and 15d-14(a) of the Securities Exchange Act of 1934, as amended.					X
31.2	Certification of Principal Financial Officer Required Under Rule 13a-14(a) and 15d-14(a) of the Securities Exchange Act of 1934, as amended.					X
32.1*	Certification of Principal Executive Officer and Principal Financial Officer Required Under Rule 13a-14(b) of the Securities Exchange Act of 1934, as amended, and 18 U.S.C. §1350.					X
101.INS	XBRL Instance Document.					X
101.SCH	XBRL Taxonomy Extension Schema Document.					X
101.CAL	XBRL Taxonomy Extension Calculation Linkbase Document.					X
101.DEF	XBRL Taxonomy Extension Definition Linkbase Document					X
101.LAB	XBRL Taxonomy Extension Label Linkbase Document					X
101.PRE	XBRL Taxonomy Extension Presentation Linkbase Document					X

+ Indicates a management contract or compensatory plan.

† Pursuant to a request for confidential treatment, portions of this exhibit have been redacted from the publicly filed document and have been furnished separately to the Securities and Exchange Commission as required by Rule 24b-2 under the Securities Exchange Act of 1934.

* Document has been furnished, is not deemed filed and is not to be incorporated by reference into any of the Company's filings under the Securities Act of 1933, as amended, or the Securities Exchange Act of 1934, as amended, irrespective of any general incorporation language contained in any such filing.

Item 16. Form 10-K Summary

None.

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.

ALDER BIOPHARMACEUTICALS, INC.

By: /s/ Randall C. Schatzman
Randall C. Schatzman, Ph.D.
President and Chief Executive Officer

Pursuant to the requirements of the Securities Act of 1934, this Annual Report on Form 10-K has been signed by the following persons on behalf of the registrant and in the capacities and on the dates indicated.

Signature	Title	Date
/s/ Randall C. Schatzman Randall C. Schatzman, Ph.D.	President, Chief Executive Officer and Director (Principal Executive Officer)	February 26, 2018
/s/ Larry K. Benedict Larry K. Benedict	Executive Vice President and Principal Accounting Officer (Principal Financial and Accounting Officer)	February 26, 2018
/s/ Stephen M. Dow Stephen M. Dow	Chairman of the Board of Directors	February 26, 2018
/s/ Paul Carter Paul Carter	Director	February 26, 2018
/s/ Paul Cleveland Paul Cleveland	Director	February 26, 2018
	Director	February 26, 2018

/s/ A. Bruce Montgomery A. Bruce Montgomery, M.D.		
/s/ Deepa R. Pakianathan Deepa R. Pakianathan, Ph.D.	Director	February 26, 2018
/s/ Heather Preston Heather Preston, M.D.	Director	February 26, 2018
/s/ Clay B. Siegall Clay B. Siegall, Ph.D.	Director	February 26, 2018
/s/ Wendy Yarno Wendy Yarno	Director	February 26, 2018