Achaogen Inc
Form 10-K
March 14, 2017

UNITED STATES

SECURITIES AND EXCHANGE COMMISSION

WASHINGTON, D.C. 20549

FORM 10-K

ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934
FOR THE FISCAL YEAR ENDED DECEMBER 31, 2016

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 001-36323

ACHAOGEN, INC.

(Exact name of registrant as specified in its charter)

Delaware	68-0533693
(State or other jurisdiction of incorporation or organization)	(I.R.S. Employer Identification No.)

7000 Shoreline Court, Suite 371

South San Francisco, CA 94080

(Address of principal executive offices including zip code)

650-800-3636

(Registrant’s telephone number, including area code)

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

Title of each class	Name of each exchange on which registered
Common Stock, $0.001 par value	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 Section 15(d) of the Act.

Yes No

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days.

Yes No

Indicate by check mark whether the registrant has submitted electronically and posted on its corporate Website, 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 of this chapter) is not contained herein, and will not be contained, to the best of registrant’s knowledge, in definitive proxy or information statements incorporated by reference in Part III of this Form 10-K or any amendment to this Form 10-K.

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer or a smaller reporting company. See the definitions of “large accelerated filer,” “accelerated filer” and “smaller reporting 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

Indicate by check mark whether the registrant is a shell company (as defined in 12b-2 of the Act).

Yes No

The aggregate market value of the common stock held by non-affiliates computed by reference to the last reported sale price on June 30, 2016 was approximately $75.5 million. As of March 1, 2017, there were 35,781,564 shares of the registrant's common stock outstanding.

DOCUMENTS INCORPORATED BY REFERENCE:

Certain information required by Part III of the Annual Report on Form 10-K is incorporated by reference to the registrant's definitive proxy statement for the registrant's 2017 annual meeting of stockholders, which will be filed with the Securities and Exchange Commission not later than 120 days after the close of the registrant's fiscal year ended December 31, 2016.

ACHAOGEN, INC.

ANNUAL REPORT ON FORM 10-K

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Part I

Forward-Looking Statements

This Annual Report on Form 10-K, including “Business” in Part I, Item I and “Management's Discussion and Analysis of Financial Condition and Results of Operations” in Part II, Item 7, contains “forward-looking statements” within the meaning of Section 21E of the Securities Exchange Act of 1934, as amended (the “Exchange Act”). All statements other than statements of historical facts contained in this Annual Report on Form 10-K are statements that could be deemed forward-looking statements reflecting the current beliefs and expectations of management with respect to future events or to our future financial performance and involve known and unknown risks, uncertainties and other factors that may cause our actual results, performance or achievements to be materially different from any future results, performance or achievements expressed or implied by these forward-looking statements. These statements are often identified by the use of words such as “may,” “will,” “expect,” “believe,” “anticipate,” “intend,” “could,” “should,” “estimate,” or “continue expressions or variations. The risks and uncertainties referred to above include, without limitation, risks related to our research and development efforts, need for future capital, timely completion of our clinical trials, uncertainty of clinical trial results or regulatory approvals or clearances, manufacturing of our product candidates at scales and costs appropriate for commercialization, enforcement of our patent and proprietary rights, potential competition and other risks that are described herein and that are otherwise described from time to time in our Securities and Exchange Commission (“SEC”) reports including, but not limited to, the factors described in Item 1A, “Risk Factors,” of this Annual Report. Given these risks and uncertainties, you should not place undue reliance on these forward-looking statements. Except as required by law, we assume no obligation to update or revise these forward-looking statements for any reason, even if new information becomes available in the future.

Item 1. Business.

Overview

We are a late-stage biopharmaceutical company passionately committed to the discovery, development, and commercialization of novel antibacterial treatments against multi-drug resistant (“MDR”) gram-negative infections. We are researching and developing plazomicin, our lead product candidate, for the treatment of serious bacterial infections, including complicated urinary tract infection (“cUTI”), blood stream infections and other infections due to MDR Enterobacteriaceae, including carbapenem-resistant Enterobacteriaceae (“CRE”). In 2013, the Centers for Disease Control and Prevention identified CRE as a “nightmare bacteria” and an immediate public health threat that requires “urgent and aggressive action.”

On December 12, 2016, we announced positive data from our two Phase 3 clinical trials for plazomicin. The first study, a Phase 3 trial of plazomicin for the treatment of patients with cUTI and acute pyelonephritis (“AP”), entitled EPIC (Evaluating Plazomicin In cUTI), is expected to serve as a single pivotal study supporting a new drug application (“NDA”) for plazomicin in the United States. The Phase 3 EPIC trial is a randomized, double blind, active controlled study in patients with cUTI and AP and allowed broad enrollment of patients with gram-negative infections. We reached agreement with the U.S. Food and Drug Administration (“FDA”) that this trial, with a 15% non-inferiority margin, comparing plazomicin to meropenem is acceptable as the single study required for potential approval. The first patient was enrolled in the Phase 3 EPIC trial in January 2016 and enrollment was closed in August 2016 with 609 patients.

In the EPIC trial, plazomicin successfully met or exceeded the objective of non-inferiority compared to meropenem for the FDA-specified primary efficacy endpoints, and achieved superiority for the primary efficacy endpoints specified by the European Medicines Agency (“EMA”). Results for the FDA pre-specified composite endpoint of clinical cure and microbiological eradication in the microbiological modified intent-to-treat (“mMITT”) population at

Day 5 achieved statistical non-inferiority, and Test-of-Cure (Day ~17) achieved statistical superiority. Results for EMA-specified endpoints of microbiological eradication at the test-of-cure visit achieved statistical superiority in both the mMITT and the microbiologically evaluable ("ME") populations. Plazomicin was generally well tolerated with no new safety concerns identified in the EPIC trial.

The second study, our Phase 3 CARE (Combating Antibiotic Resistant Enterobacteriaceae) trial was a resistant pathogen trial designed to evaluate the efficacy and safety of plazomicin in patients with serious bacterial

infections due to CRE. We closed enrollment in the CARE study in August 2016 with 69 patients, comprised of 39 patients enrolled in Cohort 1, comparing plazomicin to colistin-based therapy in patients with bloodstream infections or pneumonia due to CRE, and 30 patients in Cohort 2, a single arm cohort of plazomicin treatment in patients with serious infections due to CRE. In Cohort 1 of the CARE trial a lower rate of mortality or serious disease-related complications was observed for plazomicin compared with colistin therapy. The safety profile of plazomicin was favorable to that of colistin in critically ill patients in the CARE trial.

We plan to submit an NDA, which will include data from both the EPIC and CARE Phase 3 clinical trials, to the FDA in the second half of 2017, with a planned commercial launch of plazomicin in the United States in 2018, if our NDA is approved. We also plan to submit a Marketing Authorization Application, or MAA, to the EMA for plazomicin in 2018. In addition, we plan to publicly present detailed results from both the EPIC and CARE trials in mid-2017.

In 2012, the FDA granted fast-track designation for the development and regulatory review of plazomicin to treat serious and life-threatening CRE infections. In 2014, plazomicin received Qualified Infectious Disease Product ("QIDP") designation from the FDA. The QIDP designation was created by the Generating Antibiotic Incentives Now ("GAIN") Act, which was part of the Food and Drug Administration Safety and Innovation Act ("FDASIA") and provides certain incentives for the development of new antibiotics, including eligibility for priority review and of the NDA extension by an additional five years of any existing market exclusivity the product may be granted upon approval. Our plazomicin program has been funded in part with a contract from the Biomedical Advanced Research and Development Authority ("BARDA") for up to $123.8 million and as of December 31, 2016, $7.2 million remained available from the funding currently committed under the BARDA contract. We have global commercialization rights to plazomicin, which has composition of matter patent protection in the United States extending through at least 2031.

According to government agencies and physician groups, including the Centers for Disease Control and Prevention ("CDC") and the Infectious Disease Society of America, one of the greatest needs for new antibiotics is to treat CRE and other drug-resistant gram-negative pathogens. CRE leads to mortality rates of up to 50% in patients with bloodstream infections. We estimate that there were approximately 150,000 cases of CRE infections in the United States and five major markets in the European Union ("EU") in 2015, which we refer to as the EU 5. Based on the significant increase in resistance rates in recent years, we anticipate CRE will continue to spread and remain a major health problem. Governments, in collaboration with the private sector, have begun to respond by progressing regulatory reform and economic incentives to spur development of new antibiotics.

Plazomicin is a novel intravenous aminoglycoside antibiotic. Aminoglycosides have been used successfully for the treatment of serious infections for more than 50 years. However, the widespread clinical resistance to currently marketed aminoglycosides has increasingly limited their utility. We developed plazomicin by chemically modifying sisomicin, a naturally occurring aminoglycoside, in order to overcome common aminoglycoside resistance mechanisms. In MDR Enterobacteriaceae, including CRE, plazomicin remains active where most other antibiotics, including the commercially available aminoglycosides, have limited potency due to resistance.

We consider the following to be key attributes that support the clinical utility and commercial value of plazomicin:

- Potent in vitro and in vivo activity in nonclinical studies against MDR Enterobacteriaceae, including CRE.
- Activity in the presence of a range of resistance mechanisms, including most aminoglycoside modifying enzymes, fluoroquinolone target site mutations, extended-spectrum -lactamases, and carbapenemases.
- Demonstrated non-inferiority (day 5) and statistical superiority (day 17) to meropenem in patients with cUTI/AP infections due to Enterobacteriaceae, including fluoroquinolone-resistant and extended-spectrum -lactamase ("ESBL") producing isolates, based on topline results from our Phase 3 EPIC study.
- Lower rate of mortality and improved safety compared to colistin observed in patients with serious bacterial infections due to CRE, based on topline results from our Phase 3 CARE study.

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- Potential to improve dosing strategy, which includes individualized patient dosing using therapeutic drug management (TDM), our in vitro drug-monitoring assay, to potentially optimize both the efficacy and safety of plazomicin by dosing to a target drug concentration.
- Potential for more convenient administration as a once-daily, 30-minute IV therapy compared to other IV antibiotics administered multiple times per day with infusion times up to three hours. In particular, this supports the potential for plazomicin outpatient therapy.
- Potential to reduce the health care costs associated with the treatment of such infections.

CRE are one of many types of MDR gram-negative pathogens threatening patients. Bacteria such as Pseudomonas aeruginosa, Acinetobacter baumannii, and ESBL-producing Enterobacteriaceae, each pose "serious" resistance threats, according to the CDC, and also drive a great need for new, safe, and effective antibiotics. We have assembled the expertise and capabilities required, including chemistry and microbiology, to develop new agents for the treatment of gram-negative infections. Plazomicin was the first clinical candidate from our gram-negative antibiotic discovery engine. Our research and development pipeline includes multiple programs, including the recently disclosed C-Scape project, which is an orally-administered therapy to potentially treat patients with gram-negative infections caused by ESBL-producing pathogens, and programs that specifically target Pseudomonas aeruginosa or Acinetobacter baumannii infections.

We have developed an orally-available antibacterial candidate, called C-Scape, that is a combination of an approved -lactam and an approved -lactamase inhibitor with the potential to treat patients with complicated urinary tract infections ("cUTI"), including acute pyelonephritis, who have lost effective oral therapeutic options due to antibiotic resistance. C-Scape is under development as an orally-administered therapy to potentially treat patients with cUTI caused by MDR pathogens such as ESBL-producing Escherichia coli and Klebsiella pneumoniae. In vitro microbiology data showed potent activity against ESBL-producing Enterobacteriaceae, with an MIC90 = 1 μg/mL and rapid bactericidal activity in time-kill experiments. We believe that this non-clinical data, when combined with modeling of existing clinical pharmacokinetic data, supports our view that we may be able to achieve an oral dose regimen of three times per day.

The C-Scape drug combination was granted QIDP designation by the FDA for the treatment of cUTI, including acute pyelonephritis, in January 2017. We plan to commence C-Scape clinical development in the second quarter of 2017 and begin enrollment of a pivotal Phase 3 cUTI trial in the first half of 2018. If successful, we expect C-Scape to qualify for the 505(b)(2) regulatory pathway and FDA's guidance for Antibacterial Therapies for Patients with Unmet Medical Need for the Treatment of Serious Bacterial Diseases.

Strategy

Our strategy is to discover, develop, and commercialize new antibacterials for the treatment of gram-negative bacterial infections. Key elements of our strategy are as follows:

- Obtain regulatory approval of plazomicin in both the United States and the European Union. We have held discussions with the FDA and the EMA regarding the data packages that could support regulatory filings for plazomicin. We expect to prepare and submit an NDA to the FDA in the second half of 2017. We also intend to submit a MAA to the EMA in 2018. In 2014, plazomicin received QIDP designation from the FDA, which provides extension by an additional five years of any non-patent marketing exclusivity period that may be awarded, such as a five-year exclusivity period awarded for a new molecular entity, and makes the NDA eligible for priority review.
- Rapidly progress a second antibacterial targeting high unmet need gram-negative infections in the hospital setting. We are developing an innovative combination of an approved -lactam and an approved -lactamase inhibitor, called C-Scape, that we believe could offer a potential oral therapy to treat patients with MDR gram-negative infections such as cUTIs due to ESBL-producing pathogens. The program has the potential to enter Phase 3 in the first half of 2018 and, if approved, launch into the hospital setting

approximately two years after the plazomicin approval. In January 2017, C-Scape received QIDP designation from the FDA.

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- Demonstrate improved clinical benefit and potential pharmacoeconomic advantages of our product candidates over existing therapies. By selecting product candidates with potency against MDR pathogens, we have the opportunity to demonstrate improved clinical outcomes against the current standard of care for these bacterial infections, which is associated with poor outcomes. This strategy was demonstrated in the outcomes of the EPIC and CARE clinical trials for plazomicin. We also plan to evaluate the economic benefits of our product candidates based on pharmacoeconomic outcomes such as fewer days on mechanical ventilation, less time in an intensive care unit ("ICU"), or shorter total hospital stay.
- Commercialize our products directly in the United States and through commercialization partners elsewhere. We have global commercialization rights to our leading drug candidates. If approved, we intend to commercialize plazomicin directly using a targeted hospital-based sales force in the United States, where MDR infections, including CRE, are concentrated in resistance hotspots. Outside the United States, we intend to commercialize plazomicin with global and/or regional partners. By collaborating with companies that have an existing commercial presence and experience in targeted geographic markets, we believe we can efficiently maximize the commercial potential of our products, including plazomicin.
- Establish and leverage collaborations with non-commercial organizations for scientific expertise and funding support. We collaborate with government agencies and non-profit foundations to support our discovery efforts and advance the product candidates in our pipeline. We are currently receiving funding support for both plazomicin and our LpxC program. We have a contract for up to $123.8 million with BARDA for the development of plazomicin, with $7.2 million remaining available from the funding currently committed under the BARDA contract as of December 31, 2016. We also have a contract for up to $5.0 million with the National Institute of Allergy and Infectious Diseases ("NIAID") to support the discovery and development of LpxC inhibitors for the treatment of bacterial infections. In the past, we have also received funding support from agencies such as the U.S. Department of Defense ("DOD") and The Wellcome Trust, a global charitable foundation. We also partner and collaborate with leading academics, scientists, public health organizations, and clinicians to enhance our internal discovery and development expertise, and to jointly sponsor funding proposals.
- Build a portfolio of differentiated products for the treatment of MDR gram-negative infections. Since we commenced operations in 2004, we have focused on the discovery and development of antibiotics to treat gram-negative infections and have developed proprietary know-how about the relationship between compound structure and potency against gram-negative bacteria through our work on multiple antibiotic classes. We are using this expertise to build a portfolio of product candidates for the treatment of infections due to MDR pathogens. Patients with these infections have limited or inadequate therapeutic options leading to high rates of morbidity and mortality as well as significantly increased healthcare costs. We believe the greatest unmet medical need lies among patients with infections due to MDR gram-negative bacteria, where there is a significant and growing problem and the industry pipeline of drug candidates is sparse.

Antibacterials Background

Antibacterials, which, for small molecules, we refer to interchangeably as antibiotics, are drugs used to treat infections that are caused by bacteria. The introduction of antibiotics is recognized as one of the most transformative events in medicine. Prior to the introduction of the first antibiotics in the 1930s and 1940s, bacterial infections were often fatal, and invasive surgery was accompanied by a high risk of infectious complications. Today, antibacterials are used routinely to treat and prevent infection. According to IMS Health, antibiotics accounted for $38.4 billion in sales globally in 2015, with healthcare providers prescribing 270 million courses of antibacterials in the United States alone.

There are two main varieties of bacteria, based on a common laboratory staining test known as the "Gram stain." Gram-positive bacteria are surrounded by a single lipid membrane and a thick cell wall. Common gram-positive pathogens include Staphylococcus aureus (including methicillin-resistant strains), Streptococcus species, and Clostridium difficile. In contrast, gram-negative bacteria are encircled by two lipid membranes, an inner membrane

and an outer membrane, with a thinner cell wall in between. Gram-negative bacteria include

Pseudomonas aeruginosa, Acinetobacter baumannii, and the Enterobacteriaceae, a family of related organisms that includes Escherichia coli, Klebsiella pneumoniae, Enterobacter, Salmonella, and Shigella species. Drugs that act in the cytoplasm of gram-negative bacteria must cross both the inner and outer membranes, as distinct from drugs that just act on gram-positive bacteria, which only have to cross one membrane. Each membrane in gram-negative bacteria excludes different types of chemical entities, requiring gram-negative active antibiotics to be specifically designed to permeate both membranes. A 2007 study found that in hospital ICUs worldwide, approximately 54% of bacterial infections were caused by gram-negative organisms and 41% by gram-positive organisms, with the remainder caused by other types of bacteria.

Antibiotics are classified according to several criteria:

- Spectrum: Antibiotics that are effective against a wide variety of bacteria, including both gram-negative and gram-positive organisms, are considered to be broad-spectrum, while those that act upon only a limited number of species are considered to be narrow-spectrum. Narrow-spectrum antibiotics are most often selected if a specific pathogen is suspected or confirmed.
- Cidality: Antibiotic action generally falls into two categories: bacteriostatic and bactericidal. Bacteriostatic antibiotics halt the growth of bacteria, requiring the human immune system to clear the infection. Bactericidal antibiotics kill the bacterial pathogen directly and are preferred when the patient's immune system is not functioning optimally.
- In vitro microbiological activity: This is the ability of the antibiotic to kill or inhibit growth of bacteria in vitro. In vitro experiments and assays do not take into account the complex interactions that occur in animals or human, but are relatively easy to perform in the laboratory and usually constitute the extent of routine microbiological testing in hospital laboratories. Potency, which relates drug concentrations to activity, is commonly expressed as the minimum inhibitory concentration ("MIC") in μg/mL, which is the lowest concentration at which the drug inhibits growth of the bacteria. Antibiotics with lower MICs are considered to be more potent.
- Susceptibility/non-susceptibility: The relationship between microbiological activity and the clinical utility of an antibiotic in the hospital setting can be described in terms of susceptibility or non-susceptibility. A susceptible MIC value indicates a high probability that an antibiotic can be used to treat a particular infection. A non-susceptible MIC value from in vitro testing suggests the antibiotic is unlikely to be effective against the causative pathogen and thus should be used cautiously and under supervision of an infectious disease specialist. The MIC values defining susceptibility are established by FDA on approval of new antibiotics and medical standards organizations including the Clinical Laboratory and Standards Institute ("CLSI"), and the European Committee on Antimicrobial Susceptibility Testing ("EUCAST").
- Antimicrobial resistance: Resistance generally indicates the inability of an antibiotic to effectively treat an infection at usually administered doses. Some bacteria are naturally resistant to certain types of antibiotics. Resistance can also occur due to genetic mutations or acquisition of exogenous genetic material (eg plasmids). Mechanisms responsible for resistance to different antibiotics commonly travel together on mobile elements like plasmids which can transfer and spread between different bacteria, leading to multi-drug resistance.

New Antibiotics Are Needed for Resistant Gram-negative Infections

According to the CDC, at least two million people each year in the United States acquire serious infections with bacteria that are resistant to one or more of the antibiotics designed to treat those infections, and each year, over 23,000 patients in the United States die from these infections. In the EU, the annual burden posed by resistant healthcare associated bacterial infections is approximately 2.5 million hospital days and 25,000 deaths. Similar problems exist throughout the world, and the World Health Organization has declared antibiotic resistance a threat to global health security. The development and spread of resistance is driven by the use of antibiotics. Once they arise, resistant bacteria can be transferred between patients and antibiotic resistance mechanisms can be transferred between bacterial species, thus increasing the problem.

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Antibiotic-resistant infections not only cause significant morbidity and mortality, but also place a substantial cost burden on the healthcare system. In most cases, antibiotic-resistant infections require prolonged and/or costlier treatments, extend hospital stays, and necessitate additional doctor visits and healthcare expenditures compared with infections that are easily treatable with antibiotics. The CDC estimates that the excess annual cost resulting from these infections in the United States is as high as $20 billion. According to an estimate from a 2012 study of over 5,500 U.S. patients, the average incremental per-patient hospital cost for antibiotic-resistant healthcare-associated infections, as compared to antibiotic-susceptible infections, was over $15,000.

According to government agencies and physician groups such as the CDC and the Infectious Disease Society of America, one of the greatest needs is for new antibiotics to treat infections caused by drug-resistant gram-negative pathogens, including CRE, P. aeruginosa, and A. baumannii. These pathogens are associated with significant mortality, as growing antibiotic resistance has left limited effective treatment options. There have been few approvals for new gram-negative antibiotics in recent decades, and there are to our knowledge only a handful of other antibiotics currently in Phase 3 development for infections due to gram-negative pathogens.

Governments, in collaboration with the private sector, have begun to respond to this significant and growing unmet medical need by creating governmental and non-governmental entities tasked with addressing the problem and progressing legislation for reimbursement and regulatory reform, and economic incentives. In the United States, the federal government has developed a National Action Plan for Combating Antibiotic Resistant Bacteria, which outlines Federal activities over the five-year period from 2015 to 2020 designed (i) to enhance domestic and international capacity to prevent and contain outbreaks of antibiotic-resistant infections; (ii) to maintain the efficacy of current and new antibiotics; and (iii) to develop and deploy next-generation diagnostics, antibiotics, vaccines, and other therapeutics. The National Action Plan proposes to accelerate research and development for new antibiotics through a multifaceted approach that includes intensified support for antibiotic product development from the National Institutes of Health (“NIH”), BARDA, and the DOD’s Defense Threat Reduction Agency (“DTRA”). Accordingly, the 2016 U.S. federal budget included increases of $96 million and $100 million for BARDA and NIAID, respectively, to fund research and development for antimicrobial resistance. The federal government has also established the Presidential Advisory Council on Combating Antibiotic Resistant Bacteria, a federal advisory committee, which is designed to provide advice, information, and recommendations to the Secretary of Health and Human Services on programs and policies related to combating antibiotic-resistant bacteria.

In 2014, the United Kingdom established the Review on Antimicrobial Resistance, led by Lord Jim O’Neill, to produce an analysis of the global impact of antimicrobial resistance (“AMR”), and to propose concrete actions to address AMR globally. As of February 2, 2017, this group had published nine reports quantifying the significant impact of antimicrobial resistance, and proposing solutions to address the growing problem. These include a proposed “Global Innovation Fund for Antimicrobial Resistance”; a $2 billion fund to be funded by the pharmaceutical industry to fill existing gaps in antimicrobial research and development. In 2016, similar work in the United States aimed at identifying federal and private incentives to stimulate antibacterial development was launched by the Margolis Center for Health Policy at Duke University, under the direction of Mark McClellan, a former administrator of the Centers for Medicare & Medicaid Services (CMS) and former commissioner of the FDA.

On the legislative front, in July 2012, the FDASIA was passed, which included the Generating Antibiotics Incentives Now Act (the “GAIN Act”). The GAIN Act provides incentives for the development of new, qualified infectious disease products, including potential for priority review and the potential for adding five years to the otherwise applicable regulatory exclusivity period. In December 2016, the 21st Century Cures Act (the “Cures Act”) was passed by Congress and signed into law. This is a significant piece of legislation which is intended to modernize the regulation of drugs and spur innovation in biomedical research. Certain sections of the Cures Act support the development of new antibacterials targeting drug-resistant bacterial infections. Of note, the legislation establishes a pathway for the approval of antibacterial and antifungal drugs that are intended to treat serious or potentially fatal infections in limited

populations of patients, permitting FDA to approve such drugs for limited patient populations, notwithstanding a lack of evidence to fully establish a favorable benefit-risk profile in a population that is broader than the intended limited population.

Research and Development Pipeline

The following table summarizes the status of plazomicin and our other preclinical and research programs:

Plazomicin

Overview

Our lead product candidate is plazomicin, a new generation aminoglycoside designed by our scientists to overcome the most common aminoglycoside resistance mechanisms. Aminoglycosides have been used successfully for the treatment of serious bacterial infections for more than 50 years. As a class, aminoglycosides have several important characteristics including rapid bactericidal activity, well-characterized PK, a lack of metabolism in humans, and excellent solubility and stability. However, the spread of resistance to currently marketed aminoglycosides has decreased their clinical utility. We developed plazomicin by chemically modifying an existing aminoglycoside, sisomicin, a natural product isolated from bacteria, to shield the regions of the molecule that are targeted by the enzymes responsible for aminoglycoside resistance. As a result of these modifications, plazomicin remains active against MDR organisms where most other major drug classes, including commercially available aminoglycosides such as gentamicin and amikacin, have limited activity. Based on this profile, we are developing plazomicin as an intravenous ("IV") therapy for the treatment of serious bacterial infections due to MDR Enterobacteriaceae, including ESBL-producing Enterobacteriaceae and CRE, which the CDC considers to be among the most serious and urgent resistance threats to public health.

We consider the following to be key attributes that support the clinical utility and commercial value of plazomicin:

- Potent in vitro activity and in vivo efficacy in nonclinical studies against MDR Enterobacteriaceae, including ESBL-producers and CRE. Plazomicin retains activity in nonclinical studies against clinical Enterobacteriaceae isolates possessing -lactamases including most varieties of carbapenemases, as well as most types of resistance to other key antibiotics, including commercially available aminoglycosides, colistin, and tigecycline.
- Demonstration of similar efficacy to levofloxacin and acceptable safety in a Phase 2 clinical trial in patients with cUTIs caused primarily by susceptible Enterobacteriaceae. We have completed a successful Phase 2 clinical trial of plazomicin in patients with cUTIs, as well as required Phase 1 PK

and safety clinical trials. In patients with cUTIs, plazomicin demonstrated efficacy that was similar to levofloxacin in microbiological eradication of the causative pathogen of the infection, which were primarily Enterobacteriaceae (but mostly non-MDR Enterobacteriaceae), and in clinical outcome, specifically, resolution of baseline signs and symptoms.

- Met the objective of non-inferiority compared to meropenem in the Phase 3 EPIC trial in patients with cUTI and AP for the FDA-specified primary efficacy endpoints, and achieved superiority for the EMA-specified primary efficacy endpoints. Plazomicin was well tolerated with no new safety concerns identified in this trial. Plazomicin demonstrated non-inferiority to meropenem in our Phase 3 EPIC trial based on the primary efficacy endpoint of combined microbiological eradication and clinical cure for the FDA and was superior to meropenem based on the primary endpoint of microbiological eradication for the EMA. Plazomicin showed comparable or higher cure rates to meropenem in the subgroups of patients with infection caused by ESBL-producing and/or aminoglycoside-resistant Enterobacteriaceae. The comparator chosen for this study, meropenem, is a member of the carbapenem class of antibiotics. Due to their preserved activity against pathogens resistant to third generation cephalosporins (e.g., ESBL-producing organisms) and other antibiotic classes, carbapenems are considered the last line of defense against MDR gram-negative infections and are thus often reserved to treat such infections. In terms of safety, the overall incidence of treatment emergent adverse events, including serious adverse events, was similar across the plazomicin and meropenem groups. The demonstration of non-inferiority of plazomicin, including against key resistant pathogens, to an agent widely considered to be preferred therapy for MDR infections, combined with a generally favorable safety profile positions plazomicin as a potential alternative to carbapenems in this indication.
- A lower rate of mortality or serious disease-related complications was observed for plazomicin compared with colistin therapy in the Phase 3 CARE trial in patients with serious infections due to CRE. Favorable safety profile of plazomicin compared to colistin in a critically ill patient population in CARE trial. In Cohort 1 of CARE, plazomicin-based therapy was associated with a lower rate of 28-day all-cause mortality or serious disease relate complications as well as lower 28-day all-cause mortality alone compared to colistin-based therapy in the treatment of CRE bloodstream infections and hospital acquired and ventilator associated bacterial pneumonia. By focusing the Phase 3 CARE trial on patients with a high unmet medical need where the efficacy of the current standard of care is inadequate we observed improved outcomes for plazomicin compared with colistin therapy against CRE in the clinical setting. Plazomicin based therapy was also associated with an improved safety profile compared to colistin, including a notable reduction in adverse events related to renal function. The large reduction in mortality combined with improved safety outcomes compared to colistin, a standard of care agent for CRE infection, positions plazomicin as a potential new therapeutic option for serious infections due to CRE. Inclusion of a second, single-arm cohort (Cohort 2) in the Phase 3 CARE trial that enrolled patients not eligible for the randomized portion of the trial, allowed us to generate additional important data regarding the efficacy and safety of plazomicin as well as the use of therapeutic drug management ("TDM") in an expanded patient population.
- Potential to improve dosing strategy compared to existing aminoglycosides, and individualized patient dosing using our in vitro assay. We have taken advantage of recent innovations in PK and pharmacodynamic ("PD") modeling to create a once-a-day dosing regimen that is optimized to achieve the drug exposures projected to be efficacious in treating serious CRE infections. Patient dosing in the Phase 3 CARE trial population was also individualized by using an in vitro drug-monitoring assay to measure levels of plazomicin in the bloodstream and adjusting the dose, if necessary, to achieve the targeted drug exposure in critically ill patients.
- Improved administration as once daily, 30-minute IV therapy. Plazomicin is intended to be administered as an IV infusion once per day for 30-minutes whereas other approved gram-negative IV antibiotics, such as -lactam antibiotics, are administered multiple times per day with infusion times up to two hours. In particular, if approved, we believe the improved convenience of this administration would facilitate plazomicin for outpatient therapy.
- Potential to reduce the healthcare costs associated with the treatment of serious infections. Treatment of antibiotic-susceptible infections is associated with lower overall costs as compared to the treatment of

antibiotic-resistant infections. Our Phase 3 CARE trial of plazomicin will permit us to quantitate the pharmacoeconomic outcomes from plazomicin treatment of MDR Enterobacteriaceae, which may include fewer days on mechanical ventilation, less time in the ICU, and shorter total hospital stay.

- Potential to be used in combination therapy for the treatment of serious infections due to CRE. Combination therapy has become the standard of care for treatment of serious infections due to CRE. Aminoglycoside/ -lactam combinations may be particularly attractive based on in vitro evidence of synergistic bacterial killing and decades of experience in the use of such combinations for the treatment of difficult gram-negative pathogens. We believe in vitro data demonstrating synergistic bacterial killing against CRE with select plazomicin combinations in addition to the clinical data generated with the use of combination therapy in the Phase 3 CARE trial provides support to the use of plazomicin as part of active combination therapies for select patients.

We believe that plazomicin has the potential to become the new standard of care for the treatment of CRE, based on the attributes outlined above.

Carbapenem-Resistant Enterobacteriaceae Pose an Urgent Threat to Patients

The need for new antibiotics to treat CRE is particularly acute, as CRE are one of the top global threats in infectious disease. In 2013, the CDC labeled CRE as a “nightmare bacteria” and indicated that CRE pose a public health threat requiring “urgent and aggressive action.” These bacteria are commonly MDR, exhibiting resistance not only to carbapenems, but also to nearly all antibiotics commonly used to treat gram-negative infections, including cephalosporins, -lactam/ -lactamase inhibitor combinations, fluoroquinolones, and currently-marketed aminoglycosides. Resistance to carbapenems has been highlighted because these drugs are one of the last lines of defense against resistant gram-negative infections. Most CRE express enzymes called carbapenemases which break down the carbapenem antibiotic molecule before it can kill the bacteria. Due to the lack of effective therapies, CRE infections are associated with significant mortality, with up to 50% mortality observed in patients with bloodstream infections and greater than 70% in patients with cancer or receiving a liver transplant.

With limited treatment options available for CRE infections, physicians have resorted to drugs such as colistin, or more recently approved agents such as tigecycline or ceftazidime-avibactam with limited clinical data in CRE. However, there is evidence that these antibiotics are failing patients. For example, in bloodstream infections due to carbapenemase-producing K. pneumoniae, all-cause mortality for treatment with colistin, tigecycline, or combinations of antibiotics that do not include a carbapenem active in vitro against the infecting isolate were reported to be 46%, 47%, and 37%, respectively. Recently, resistance to even these last-resort treatments has begun to be reported, further increasing the urgency for new therapeutic options. In addition, a recent case series from the University of Pittsburgh detailing treatment of 37 CRE cases with ceftazidime-avibactam reported clinical success in only 59% of patients, with recurrence of CRE in 23% of those patients within 90 days. Most alarmingly, they also saw microbiological failure in 27% of patients and resistance to ceftazidime-avibactam was seen in 30%.

The CRE problem is global and the incidence has increased significantly over the last decade. For example, recent microbiological surveillance efforts conducted by JMI Laboratories for us indicate that the rate of carbapenem resistance among Klebsiella pneumoniae in the United States exceeded 6% in 2014 and 2015, a significant increase compared with a rate of below 1% in 2004 according to data from the Surveillance Network-USA (TSN). In Italy, 36% of K. pneumoniae strains were carbapenem-resistant in 2015, a sharp increase from 2010 when the rate was 16%. The problem is even more pronounced in Greece, with more than 62% of K. pneumoniae strains exhibiting resistance in 2015.

We estimate that there were approximately 150,000 cases of CRE infections in the United States and the EU5 in 2015, of which 65,000 to 75,000 were in the United States. We believe that CRE incidence will continue to increase in the future. A key driver of resistance growth, the use of carbapenems, is increasing. Once restricted in use to limit the emergence of resistance, hospitals are changing their policies due to the pressing need for carbapenems to treat the

growing number of MDR infections. For example, ESBL-producing bacteria now account for over 18% of E. coli cultured from urine in the United States. This has led to carbapenems being used in 350,000 cases of UTI infection in 2014 up from 72,000 a decade ago. Two-thirds of U.S. hospital pharmacy directors reported that carbapenems are now unrestricted on their hospital formularies, likely a reflection of the increasing incidence of difficult-to-treat gram-negative infections. Additionally, the spread of CRE among patients, between

healthcare facilities, and across geographic regions is exacerbated by the ability of Enterobacteriaceae to readily transfer their resistance genes from one bacterium to another. Especially concerning is the potential of CRE to spread in the outpatient setting, which could lead to an epidemic of community-based CRE infections.

Extended-spectrum beta-lactamase (ESBL)-producing Enterobacteriaceae Pose a Serious Threat to Patients

The need for new antibiotics to treat ESBL-producing Enterobacteriaceae is high, as these bacteria have become widespread globally in both healthcare-associated and community-onset infections and the use of carbapenems to treat infections caused by these organisms is felt to be contributing to the rise in CRE. In 2013, the CDC indicated that ESBL-producing Enterobacteriaceae pose a serious concern to public health threat requiring “prompt and sustained action.” Similar to CRE, these bacteria are commonly MDR, exhibiting resistance not only to extended spectrum cephalosporins but also to fluoroquinolones, and currently-marketed aminoglycosides. In many cases the remaining treatment option is a carbapenem and use of carbapenems to treat these infections is thought to be contributing to increased carbapenem resistance. We estimate that there were greater than 600,000 cases of hospital treated infections caused by ESBL-producing Enterobacteriaceae in the United States in 2016. Infections caused by these organisms are associated with significant mortality; patients with bloodstream infections caused by ESBL-producing Enterobacteriaceae are approximately 57% more likely to die than those with bloodstream infections caused by a non ESBL-producing strain.

Commercial Strategy for Plazomicin

Our overall goal is to establish plazomicin as the standard of care for the treatment of serious bacterial infections due to MDR Enterobacteriaceae, including CRE. Our strategy is intended to support plazomicin’s differentiated profile from both approved and development-stage antibacterials. Our clinical development program is focused on the treatment of serious bacterial infections due to Enterobacteriaceae in patients with limited or no alternative treatment options, including patients with cUTI or AP. Based on feedback from the FDA, we expect the Phase 3 EPIC trial in cUTI and AP to serve as a single pivotal study supporting an NDA for plazomicin in the United States, which we expect to submit in the second half of 2017 and, if approved, would enable plazomicin to be used as a treatment for MDR gram-negative pathogens, including CRE and ESBL-producing pathogens. We believe the Phase 3 CARE trial provides important data about plazomicin’s potential in treating patients with CRE infections, where there are limited treatment options currently available.

Given the lack of effective therapeutic options and the increasing rates of gram-negative infections such as CRE and those caused by ESBL-producing bacteria, the commercial opportunity for plazomicin is significant. We anticipate that the effectiveness of plazomicin in our Phase 3 program, along with extensive data describing plazomicin’s microbiological activity and Pharmacokinetic (“PK”)/Pharmacodynamic (“PD”) properties, will create significant physician demand for plazomicin based on our primary market research. A demonstrated efficacy and safety benefit versus colistin in a patient population with a high risk of death due to CRE infections, and superiority to a carbapenem in treating cUTI/AP, will be key product differentiators that drive adoption.

If approved, we expect that the pricing and reimbursement for plazomicin will reflect the strong clinical data and the lack of effective treatment options for gram-negative infections such as CRE and ESBL-producing bacteria. At a 2013 forum sponsored by The Pew Charitable Trusts, a nonprofit organization, which brought together payors, the FDA, and industry representatives, panelists indicated support for an approximate price point of $15,000 per treatment course for new antibacterial agents for resistant infections as long as clinical and economic benefits were clearly demonstrated. For comparison, recently launched ceftazidime-avibactam currently costs $900 per day reflecting a course of therapy from $9,000 to $13,000.

If approved, we expect physicians to consider using plazomicin for definitive treatment of patients with MDR gram-negative pathogens, including CRE and ESBL-producing pathogens, as well as for empiric treatment, or treatment prior to definitive confirmation of the pathogen, of patients who are at risk of CRE. Definitive treatment for CRE begins when the infecting pathogen has been confirmed as CRE. Length of therapy with plazomicin was 5-7 days in EPIC for cUTI and 7-14 days for patients with either bloodstream infections or pneumonia. We estimate that there were approximately 150,000 cases of confirmed CRE infections in the United States and the EU 5 in 2015 of which 65,000 to 75,000 were in the United States. Given the importance of providing effective CRE therapy as soon as possible in order to reduce the risk of death, if approved, we believe physicians will consider using plazomicin empirically to treat patients who are at a high risk of CRE infection and at hospitals with high rates of

CRE. Empiric treatment continues until the pathogen is confirmed, which typically takes 2 to 3 days. Following pathogen confirmation, definitive treatment begins either with the same drug(s) used for empiric treatment or with different drug(s), depending on numerous factors including the identity and susceptibility of the pathogen, as well as patient response to empiric therapy. We estimate the total number of cUTI, pneumonia or bloodstream infections treated empirically in the United States and the EU 5 was approximately eight million in 2014. We estimate that approximately 1.4 million of these empirically treated cases involved consultation with an infectious disease physician, a proxy for the number of more complicated cases or serious infections, including suspected MDR infections. This smaller subset of empirically treated patients is a more relevant population in which plazomicin might be prescribed to provide empiric treatment for CRE, depending on a number of CRE risk factors, including patient colonization with CRE and high incidence of CRE in the hospital unit.

If approved, we intend to focus our initial commercial efforts on the U.S. market, which we believe represents the largest single market opportunity for plazomicin. We plan to use a targeted U.S. sales force to promote plazomicin to hospital-based healthcare professionals where MDR infections, including CRE, are concentrated in resistance hotspots, including New York City, Los Angeles and Chicago, and other major population centers, either alone or with support from a commercialization partner. In key markets outside of the United States, including Europe, Asia, and Latin America, we believe we can maximize the value of plazomicin through licensing full product rights to one or more global or regional commercialization partners who have local market expertise. By collaborating with companies that have an existing commercial presence and experience in targeted geographic markets, we believe we can efficiently maximize plazomicin’s commercial potential.

Plazomicin Development Program

We are developing plazomicin, our lead product candidate, for the treatment of serious bacterial infections due to MDR Enterobacteriaceae in patients with limited or no alternative treatment options. These include patients with cUTI, including AP, due to MDR Enterobacteriaceae, including ESBL-producing isolates and CRE. In our Phase 3 EPIC study in patients with cUTI, including AP, plazomicin successfully met FDA- and EMA-specified primary efficacy endpoints and was well tolerated with no new safety concerns, providing evidence of efficacy and safety of plazomicin in this indication. The EPIC study is expected to serve as a single pivotal study supporting a NDA for plazomicin in the United States. In our other Phase 3 study (CARE) in patients with serious infections due to CRE, a lower rate of mortality or serious disease-related complications was observed for plazomicin compared with colistin therapy and the safety profile of plazomicin was favorable compared to that of colistin. The CARE trial provides important data about plazomicin’s potential in treating patients with CRE infections, where treatment options are currently limited.

In 2012, the FDA granted fast track designation for the development and regulatory review of plazomicin to treat serious and life-threatening CRE infections. In 2014, plazomicin received QIDP designation from the FDA. The QIDP designation was created by the GAIN Act, which was part of the FDASIA and provides certain incentives for the development of new antibiotics, including eligibility for priority review and an extension of five years to an existing period of non-patent market exclusivity. We plan to submit an NDA, which will include EPIC and CARE data, to the FDA in the second half of 2017, with a planned commercial launch of plazomicin in the United States in 2018, if our NDA is approved. We also plan to submit an MAA to the EMA for plazomicin in 2018. In addition, we plan to publicly present detailed results from both the EPIC and CARE trials in 2017.

Key elements of our clinical development program for plazomicin are outlined in the table below:

Completed Phase 3 Clinical Studies

Study/Phase	Objectives	Number Enrolled
EPIC/ 3	Primary: Demonstrate the non-inferiority of plazomicin compared with meropenem based on the difference in composite microbiological eradication and clinical cure rate in the microbiological modified intent-to-treat (mMITT) population at both the Day 5 and test-of-cure (TOC) visits in patients with cUTI and AP Secondary : Safety, PK of plazomicin	609
CARE - Cohort 1/ 3	Primary: Evaluate the efficacy of plazomicin as compared to colistin with respect to all-cause mortality or significant disease-related complications at 28 days in patients with serious CRE infections Secondary: Safety, PK of plazomicin	39
CARE - Cohort 2/ 3	Exploratory: Evaluate the efficacy, safety and PK of plazomicin in patients with serious CRE infections	30

Completed Phase 1 and Phase 2 Clinical Studies

Study No.	Objectives	Number Enrolled	Key Result
001	Phase 1 trial of safety and PK after single and multiple doses in healthy subjects	39	Plazomicin was well tolerated at doses of up to 15 mg/kg for 3 days.
003	Phase 1 trial of safety, plasma PK and lung penetration in healthy subjects	40	Plazomicin was well tolerated at doses of up to 15 mg/kg for 5 days. Plazomicin penetrated into the lung to a similar degree as other aminoglycosides.
004	Phase 1 trial of safety and PK in healthy and impaired kidney function subjects	24	As with other aminoglycosides, plazomicin's dose needs to be adjusted in patients with moderately or severely impaired kidney function.
006	Phase 1 thorough QT/QTc trial in healthy subjects	64	Plazomicin showed no clinically relevant potential to increase risk for cardiac arrhythmias at single doses of up to 20 mg/kg.
002	Phase 2 safety, efficacy, and PK in patients with cUTI	145	Plazomicin displayed efficacy similar to the comparator antibiotic treatment (levofloxacin). Plazomicin was generally well tolerated at doses of up to 15 mg/kg for 5 days.

Phase 3 EPIC Trial of Plazomicin for the Treatment of cUTI

Our Phase 3 EPIC trial was a randomized, multicenter, multinational, double-blind study of the efficacy and safety of plazomicin in the treatment of cUTI, including AP, in adults, compared with meropenem and allowed an optional switch to oral therapy. We compared plazomicin 15 mg/kg IV given once daily to meropenem 1.0 gram IV every eight

hours with the option to switch to open-label levofloxacin after a minimum of four days of blinded IV study drug to complete a total of 7 to 10 days of therapy (IV plus oral). The trial was designed to show that plazomicin was non-inferior to meropenem based on FDA primary endpoints of composite clinical and microbiological cure and the Day 5 and TOC visits and the EMA primary endpoint of microbiological eradication at the TOC visit in the mMITT and ME populations. We enrolled 609 patients in the EPIC trial. Plazomicin successfully met the objective of non-inferiority compared to meropenem for the FDA-specified primary efficacy endpoints, and achieved superiority for the EMA-specified primary efficacy endpoints. Results for the FDA pre-specified composite endpoint of clinical cure and microbiological eradication in the microbiological modified intent-to-treat ("mMITT") population were as follows: Day 5: 88.0% plazomicin vs. 91.4% meropenem (difference –3.4%, 95% confidence interval ("CI"): –10.0% to 3.1%), indicating statistical non-inferiority; and Test-of-Cure: 81.7% plazomicin vs. 70.1% meropenem (difference 11.6%, 95% CI: 2.7% to 20.3%), indicating statistical superiority.

Results for EMA-specified endpoints of microbiological eradication at the test-of-cure visit were as follows: mMITT: 87.4% plazomicin vs. 72.1% meropenem (difference 15.4%, 95% CI: 7.5% to 23.2%), indicating statistical superiority; microbiologically evaluable ("ME"): 90.5% plazomicin vs. 76.6% meropenem (difference 13.9%, 95% CI: 6.3% to 21.7%), indicating statistical superiority. Consistent with the overall results of the primary endpoint at the TOC visit, plazomicin showed comparable or higher cure rates to meropenem in the subgroups of patients with infection caused by ESBL-producing, aminoglycoside-resistant, and/or carbapenem-resistant Enterobacteriaceae. These results demonstrate the potential utility of plazomicin as treatment for cUTI, including AP, where treatment options are limited and help to position plazomicin as an alternative to carbapenems in the treatment of urinary tract infections due to ESBL-producing and other MDR gram-negative pathogens.

Plazomicin was well tolerated with no new safety concerns identified in the EPIC trial. Total treatment emergent adverse events ("TEAEs") related to renal function were reported in 3.6% and 1.3% of patients in the plazomicin and meropenem groups, respectively. TEAEs related to cochlear or vestibular function were reported in a single patient in each of the plazomicin and meropenem treatment groups. Both events were considered mild and resolved completely.

The first patient in our global Phase 3 EPIC trial for the treatment of cUTI and AP was enrolled in January 2016 and enrollment was closed in August 2016 with 609 patients. Top-line results were announced December 2016 and we expect to submit an NDA for plazomicin in the second half of 2017, with a planned commercial launch of plazomicin in the U.S. in 2018, if our NDA is approved. We also plan to submit an MAA to the EMA for plazomicin in 2018.

Phase 3 CARE Trial of Plazomicin for the Treatment of CRE

Our Phase 3 CARE (Combating Antibiotic Resistant Enterobacteriaceae) trial was a resistant pathogen-specific trial designed to evaluate the efficacy and safety of plazomicin in patients with serious bacterial infections due to CRE. The study consisted of two cohorts of patients:

- Cohort 1 – a randomized, comparator-controlled cohort to compare plazomicin 15 mg/kg IV once daily with colistin 300 mg loading dose followed by 5 mg/kg divided every eight hours or every twelve hours (each in combination with adjunctive meropenem or tigecycline) for the treatment of blood stream infections ("BSI"), or Hospital-Acquired Bacterial Pneumonia ("HABP")/Ventilator-Associated Bacterial Pneumonia ("VABP")

- Cohort 2 – a single-arm cohort to evaluate plazomicin 15 mg/kg IV once daily in combination with adjunctive antibiotic therapy (investigator's choice) in patients with BSI or HABP/VABP (who are not eligible for enrollment in Cohort 1); and to evaluate plazomicin monotherapy, followed by optional oral step-down therapy, in patients with cUTI or AP

The purpose of Cohort 2 was to allow access to plazomicin therapy for patients who were not eligible for enrollment in Cohort 1 and who had limited alternative treatment options available. This cohort includes two relatively distinct patient populations: 1) patients with colistin-resistant CRE or polymicrobial infections involving additional Gram-negative pathogens and thus higher anticipated mortality than patients enrolled in Cohort 1, and 2) those with low Acute Physiology and Chronic Health Evaluation (APACHE II) scores (< 15) and relatively less severe infection types (e.g. cUTI and AP) and thus lower anticipated overall mortality than patients enrolled in Cohort 1.

Dosing of plazomicin in our Phase 3 CARE trial was individualized for each patient based on therapeutic drug management ("TDM"). The use of TDM for currently marketed aminoglycosides has been shown to help achieve target drug exposures, leading to improved patient outcomes and reduced length of hospital stays. To support TDM, plazomicin plasma concentrations were determined using an investigational in vitro assay. In November 2013, we received an Investigational Device Exemption approval from the FDA for use of the assay in the trial.

We closed enrollment in the CARE study in August 2016 with 69 patients; 39 patients with BSI or HABP/VABP due to CRE were randomized to Cohort 1 and 30 patients with BSI, HABP/VABP or cUTI due to CRE were enrolled in Cohort 2.

In Cohort 1 of the CARE trial, a lower rate of mortality or serious disease-related complications was observed for plazomicin compared with colistin therapy. Results from Cohort 1 of the CARE trial were as follows: Day 28 all-cause mortality or significant disease related complications (primary endpoint): 23.5% plazomicin vs. 50.0% colistin (difference 26.5%, 90% CI: –0.7% to 51.2%); Day 28 all-cause mortality: 11.8% plazomicin vs. 40.0% colistin (difference 28.2%, 90% CI: 0.7% to 52.5%). Results from Cohort 2 of the CARE trial were as follows: Day 28 all-cause mortality or significant disease related complications: 39.1%; Day 28 all-cause mortality: 26.1%. All deaths occurred in patients with additional Gram-negative pathogens (Acinetobacter or Pseudomonas), a condition excluded from Cohort 1. Two of four cUTI patients in Cohort 2 had clinical and microbiological cure at the TOC visit.

The safety profile of plazomicin was favorable compared to that of colistin in the critically ill patient population enrolled in the CARE trial. Study drug-related TEAEs related to renal function were reported in 16.7% and 38.1% of patients in the plazomicin and colistin groups of Cohort 1, respectively. No TEAEs related to cochlear or vestibular function were reported in either group. However, due to the clinical status of patients enrolled in the trial who were frequently ventilated and unconscious, planned assessments of hearing and tinnitus were not possible for many of the patients. In Cohort 2, study drug-related TEAEs related to renal function were reported in 13.3% of patients and no TEAEs related to cochlear or vestibular function were reported.

We intend to include the data from this Phase 3 CARE study along with the data from our Phase 3 EPIC study in an NDA submission for approval of plazomicin. We also intend to submit the CARE results to a peer-reviewed journal and for presentation at one or more medical meetings in 2017. Based on physician market research, we believe the Phase 3 CARE study could provide important and meaningful data regarding the efficacy, safety, microbiology, and dosing, to better inform their use of plazomicin in the treatment of patients with CRE infections.

Research and Early Development Programs

Beyond our plazomicin program, the research and early development teams are focused on discovering novel medicines for serious unmet medical needs. We have assembled a well-balanced portfolio of small molecule and antibody programs. Our small molecule programs focus on our core areas of expertise in the gram-negative antibacterial discovery and development. Our antibody portfolio is a blend of infectious disease programs and non-infectious disease programs that are well suited for our innovative antibody discovery methods. We continue to attract key talent and leadership within our research and early development organization to enable efficient transition of molecules from discovery through Phase 1. In addition to our strong internal expertise, we have a long history of engaging world-class research and clinical experts across academia and industry to increase the likelihood of success of our research programs. We also maintain active collaborations with academic research groups to enable the rapid flow of cutting edge science into biotechnology translation. Additional detailed information regarding our two Early Development programs, C-Scape and LpxC is included below, as well as information regarding our research programs.

C-Scape Early Development Program

Between 10% and 30% of clinical Enterobacteriaceae isolates in the United States and European Union (“EU”) produce ESBLs, rendering them resistant to all -lactam antibiotics except for carbapenems. The majority of these isolates are also resistant to all oral therapy options for serious infections, including fluoroquinolones, trimethoprim-sulfamethoxazole and cephalosporins. Consequently, the use of carbapenem is increasing rapidly; for instance in 2009 100,000 patients hospitalized for a cUTI, in the United States received a carbapenem and in 2014 over 350,000 patients received a carbapenem. In the setting of cUTI, including acute pyelonephritis, physicians are faced with a dilemma of treating a patient empirically with oral antibiotics in the outpatient setting, which risks treatment failure in a significant proportion of cases, or admitting the patient to the hospital for intravenous carbapenem therapy, which in many cases is an inappropriate use of a “last-line” antibiotic therapeutic option. A new

oral antibiotic is needed to reduce the burden and cost of hospitalization, spare carbapenem use, reduce the complications associated with the use of IV catheters, and minimize the risk of oral antibiotic treatment failure. To address this unmet medical need, Achaogen is developing a fixed-dose oral combination of two US FDA-approved agents, a -lactam and a -lactamase inhibitor, for the treatment of adult patients with cUTI caused by Enterobacteriaceae, including ESBL-producing and fluoroquinolone-resistant strains, where limited oral treatment options exist currently.

C-Scape is potent against the target pathogens. In a panel of 379 ESBL-producing Enterobacteriaceae from hospitalized patients with UTIs in the U.S. and E.U. (2014-2015), C-Scape achieved an MIC90 of 1 µg/mL. Moreover, in vitro time-kill experiments have shown that C-Scape was rapidly bactericidal against ESBL-producing Enterobacteriaceae. Based on these data the FDA granted C-Scape a QIDP designation in January 2017.

We believe that C-Scape has the potential to rapidly address a serious unmet need for an effective oral treatment for patients with cUTI, including AP, caused by ESBL-producing Enterobacteriaceae. Both the -lactam and the -lactamase inhibitor compounds have been previously approved by the FDA, therefore we expect C-Scape to qualify for the 505(b)(2) NDA regulatory pathway for the combination product, which would permit the application to rely in part on the FDA's findings of safety and effectiveness for each compound alone, and FDA's guidance for Antibacterial Therapies for Patients with Unmet Medical Need for the Treatment of Serious Bacterial Diseases. Achaogen intends to submit an Investigational New Drug ("IND") application to the FDA in the second half of 2017 and to conduct a Phase 1 multiple-dose pharmacokinetic study outside the US, which, if completed in conjunction with the existing human pharmacokinetic data and newly generated nonclinical pharmacokinetic/pharmacodynamic data, should inform dose selection for a Phase 3 study. We intend to initiate a single pivotal Phase 3 study in patients with cUTI, including acute pyelonephritis, who are suitable for treatment with oral antibiotics, by the first half of 2018. If successfully developed and approved, we anticipate C-Scape may be eligible for three years of new clinical investigation exclusivity under the Hatch Waxman Act, with an additional five years of non-patent exclusivity conferred by QIDP designation. We are actively seeking non-dilutive funding to support the Phase 3 program and additional late-stage activities through launch.

Small Molecule Optimization Program

LpxC is an essential enzyme for the formation of bacterial membranes in gram-negative bacteria that is highly conserved among Gram-negative species. Inhibition of LpxC disrupts the structural integrity of the outer bacterial membrane, reducing its capacity to protect the cell and retain vital molecules in the space between the outer and inner membrane, leading to bacterial cell death.

Using our discovery engine, we made improvements to known LpxC inhibitors to generate a series of promising molecules that showed greater activity against Gram-negative pathogens, improved safety in preclinical models, and better pharmaceutical properties. Given their novel mechanism of action, compounds generated in this program demonstrate no cross-resistance with current antibiotics and therefore retain activity against strains harboring resistance mechanisms that inactivate many other marketed antibiotics. This is illustrated in the figure below with respect to one of our lead compounds which demonstrates potent activity against a large set of 250 P. aeruginosa clinical respiratory isolates. Moreover, our lead compounds show potent in vivo activity against multi-drug resistant P. aeruginosa strains.

In vitro activity against 250 clinical respiratory isolates of P. aeruginosa (2010-2016)

Compound	MIC_{50} (µg/ml)	MIC_{90} (µg/ml)
Lead LpxC inhibitor	1	2
Tobramycin	0.5	>8*
Levofloxacin	1	>8*
Ceftazidime	4	>16*
Meropenem	0.5	>8*
Colistin	1	1

*Above the breakpoint for susceptibility.
Abbreviations: MIC_{50}, minimal concentration at which the growth of 50% of the isolates is inhibited

in vitro; MIC_{90}, minimal concentration at which the growth of 90% of the isolates is inhibited in vitro.

Activity of a lead LpxC inhibitor in a murine neutropenic lung model with a multi-drug resistant epidemic cystic fibrosis P. aeruginosa strain. (Abbreviations: BID, twice daily; CFU, colony forming units; IV, intravenous; MIC, minimal inhibitory concentration; QD, once daily; SC subcutaneous.)

We are currently pursuing an advanced series of compounds that are active against P. aeruginosa, supported by up to $5.0 million in funding from a contract with NIAID, with the goal of identifying those with potent antibacterial activity and an improved safety profile for selection of a candidate for IND-enabling studies in 2017. We are also actively seeking non-dilutive funding to support the IND enabling program and Phase 1 studies.

Therapeutic Antibody Discovery Program

- Antibacterial monoclonal antibodies: Our antibody discovery platform aims to generate antibodies that can treat infections caused by MDR gram-negative pathogens. We have built an antibody discovery platform that allows the rapid identification of rare antibodies that disrupt bacterial membrane biogenesis, leading to bacterial cell death. The platform leverages recent advances in microfluidics, single B cell antibody cloning, and our deep expertise in bacterial genetics, to directly screen millions of single B cells for functional bactericidal antibodies within hours, making rare functional antibody discovery possible.
- Other monoclonal antibody programs: In May 2016, we announced that we entered a collaboration and license agreement with Crystal Bioscience to identify and develop therapeutic antibodies against multiple novel targets. We are using Crystal Bioscience's humanized chicken platform to seek to identify therapeutic antibodies to validated human targets that have proved difficult to target utilizing traditional antibody discovery methods in mice. We have initiated antibody discovery efforts on two targets with Crystal Bioscience.

Government Contracts

Biomedical Advanced Research and Development Authority ("BARDA")

Our program to develop plazomicin for the treatment of serious bacterial infections due to MDR Enterobacteriaceae, including CRE, as well as for disease caused by certain bacterial biothreat pathogens, is partially funded under a contract with BARDA, an agency of the U.S. Department of Health and Human Services. This contract was awarded in August 2010 and consists of a base amount as well as three options, all of which have been exercised. The base amount and the three exercised options total $123.8 million of obligated funding, of which a total of $116.6 million has been recorded as revenues as of December 31, 2016, with $7.2 million remaining available.

Overall, the contract calls for the development, manufacturing, nonclinical and clinical evaluation of, and regulatory filings for, plazomicin as a countermeasure for diseases caused by antibiotic-resistant pathogens. These pathogens include bacteria associated with serious hospital-acquired infections, such as CRE, as well as biothreats, such as F. tularensis, which causes tularemia, and Y. pestis, which causes plague. As the prime contractor, we are responsible for all technical and regulatory activities under a research plan proposed by us and accepted by BARDA.

From time to time, we may propose a change to the research plan to BARDA, and BARDA may or may not choose to accept the change to the research plan, along with any associated additional costs, subject to the availability of funding, as well as other factors. We are also obligated under the contract to satisfy various federal reporting requirements, including technical reporting with respect to our plazomicin development activities, reporting with respect to intellectual property and financial reporting. In addition, technical documents and regulatory filings may be reviewed by BARDA prior to their finalization and/or submission.

Payments under the contract with BARDA are made in installments as activities are conducted in accordance with the research plan. Payments to us are based on direct costs incurred and allowances for overhead, plus a fee, where applicable. In November 2013, we modified the most recent awarded option such that payments under this option would not exceed $60.4 million, even though the cost of the Phase 3 CARE trial and related expenses may exceed the amount available to us under our BARDA contract for direct costs incurred. In May 2016, we were awarded an additional $20.0 million from Option 3 of the BARDA Contract to support the Phase 3 EPIC trial of plazomicin, bringing the total committed funding under the contract to $123.8 million. Under standard government contracting terms, the government receives only limited rights for government use of certain of our pre-existing data and certain data produced with non-federal funding, to the extent such data are required for delivery to BARDA under the project. The U.S. government receives unlimited rights to use and disclose new data first produced under the project with BARDA funding. The U.S. government is entitled to a nonexclusive, worldwide, royalty-free license to practice or have practiced any patent on an invention that is conceived or first reduced to practice under the project, and may obtain additional rights if we do not elect to retain ownership of a subject invention or if we do not satisfy certain disclosure and patent prosecution obligations with respect to a subject invention. The government’s rights do not include the composition of matter patents related to plazomicin, as these were developed and prosecuted prior to our entry into the BARDA contract and without government funding. The BARDA contract does not entitle the government to any sales royalties or other post-commercialization financial rights.

BARDA is entitled to terminate the project for convenience at any time provided reasonable closeout costs are paid, and is not obligated to provide funding beyond currently obligated amounts allotted from Congressionally appropriated funds.

Defense Threat Reduction Agency (“DTRA”)

In June 2007, we entered into a contract with DTRA to develop novel antibacterials for the treatment of biodefense pathogens. In November 2012, DTRA terminated this contract for convenience. We sought payment from DTRA for additional expenses we incurred in connection with this contract, and on April 30, 2015 received $7.1 million.

The DTRA contract related to the funding of our LpxC program. Under the contract’s terms, the U.S. government received rights to use and disclose new data first produced under the project with DTRA funding only to the extent they are related to government applications connected with certain select pathogens. In addition, the U.S. government is entitled to a nonexclusive, worldwide, royalty-free license to practice or have practiced any patent on an invention that was conceived or first reduced to practice under the project, including the composition of matter patent related to ACHN-975 (a compound we previously pursued in a clinical trial), and may obtain additional rights if we do not elect to retain ownership of a subject invention or if we do not satisfy certain disclosure and patent prosecution obligations with respect to a subject invention.

National Institute of Allergy and Infectious Diseases (“NIAID”)

In September 2008, we entered into a five-year contract with NIAID to develop novel antibacterials for the treatment of biodefense pathogens. We received over $21.0 million under this contract, which supported a previous research and development program that we currently do not intend to advance. Our NIAID contract expired in August 2013. The

U.S. government retains certain rights to data and intellectual property generated under the contract.

In July 2014, we were awarded a one-year, $0.4 million grant by NIAID to conduct discovery research on novel antibiotics targeting gram-negative bacteria. In July 2015, NIAID extended the grant term through July 31, 2016.

In July 2015, we were awarded a contract by NIAID for $1.5 million through June 30, 2016. In January 2016, the contract amount was increased to $2.0 million. In April 2016, the first contract option was awarded, providing an additional $2.4 million and extending performance through January 18, 2018. The final contract option remains available with additional funding of up to $0.6 million available, for a total of $5.0 million. As of December 31, 2016, $3.5 million of the total awards has been recorded as revenues. The U.S. government retains certain rights to data and intellectual property generated under the contract.

For more information regarding the government contracts referred to above see “Risk Factors-Risks Related to Our United States Government Contracts” and “Risk Factors-Risks Related to Intellectual Property-Provisions in our U.S. government contracts, including our contract with BARDA, may affect our intellectual property rights.”

Commercial Agreements

License Agreement with Ionis Pharmaceuticals, Inc. (formerly Isis Pharmaceuticals, Inc.)

On January 25, 2006, we entered into a license agreement with Ionis Pharmaceuticals, Inc. (“Ionis”), pursuant to which Ionis granted us an exclusive license under certain patents relating to aminoglycoside antibacterial compounds and related know-how to develop and commercialize certain novel aminoglycoside antibacterial compounds. We are required to use commercially reasonable efforts to develop and commercialize certain compounds under the agreement. In consideration for the rights granted to us by Ionis under the license agreement, we issued $1.5 million of our Series A convertible preferred stock to Ionis in 2006. In addition, we are required to make payments to Ionis upon the achievement of specified development and regulatory milestones totaling up to $19.5 million for the first aminoglycoside product developed under the agreement, including $4.0 million that was paid to Ionis in the fourth quarter of 2014 following dosing the first patient in our Phase 3 CARE trial of plazomicin in September 2014, and up to $9.75 million for a second aminoglycoside product, if any, developed under this agreement, and to pay Ionis a low double-digit share of non-royalty sublicensing revenues that we receive from sublicensees for the grant of sublicenses under our agreement with Ionis, provided that the maximum amount we are required to pay Ionis with respect to the sum of all development and regulatory milestones and non-royalty sublicensing revenue payment obligations for plazomicin, to the extent it is the first aminoglycoside product under the agreement, is $19.5 million. Likewise, our cumulative development and regulatory milestone payment and non-royalty sublicensing revenues payment obligations for a possible second aminoglycoside product under the agreement with Ionis will not exceed $9.75 million. To date, we have made development milestone payments of $7.0 million to Ionis with respect to plazomicin, $6.5 million of which was paid in cash and $0.5 million of which was paid in the form of our Series B convertible preferred stock. We are also required to pay additional milestone payments of up to $20.0 million in the aggregate upon the first achievement of specified threshold levels of annual net sales of certain aminoglycoside products in a calendar year. If any aminoglycoside product covered by the agreement is successfully commercialized, we will be required to pay royalties to Ionis in the low single digits on worldwide net sales of licensed products by us, our affiliates and sublicensees.

Our license agreement with Ionis will continue for as long as we are obligated to pay royalties to them, which will be on a product-by-product basis until the later of (a) ten years from the date of first commercial sale of an aminoglycoside product covered by the agreement in the United States, Japan or Europe; and (b) the abandonment, revocation, invalidation or expiration of the last valid claim of a patent covered under the agreement which covers such product, not to exceed twenty years after the first commercial sale in the United States, Japan or Europe. Either party may terminate the agreement for the uncured material breach of the other party, and Ionis may terminate the agreement if we fail to make timely payments, subject to a specified cure period. We may also terminate the agreement or the license with respect to a particular product without cause upon 60 days’ notice.

Thermo Fisher Collaborative Development and Commercialization Agreement

In April 2016, we entered into a collaborative development and commercialization agreement (the "Assay Agreement") with Microgenics Corporation ("Thermo Fisher"), a wholly owned subsidiary of Thermo Fisher Scientific Inc. Under the Assay Agreement, we and Thermo Fisher are co-developing and commercializing an in vitro assay to measure levels of plazomicin in the blood and other body fluids to enable patients to receive safe and efficacious doses of plazomicin. If plazomicin is approved, we and Thermo Fisher plan to have a commercial assay available at the time of the commercial launch of plazomicin. The assay to be developed under the Assay Agreement would be used to provide therapeutic drug management to certain patients receiving plazomicin. Thermo Fisher is responsible for the research, development, manufacture and sale of the assay. Depending on the mutually agreed regulatory approval pathway and commercialization strategy for the assay, we are required to pay Thermo Fisher up to an aggregate amount of approximately $6.5 million in milestone payments for the achievement of certain development, manufacturing and regulatory milestones. Intellectual property rights relating solely to the assay developed under the Assay Agreement are owned by Thermo Fisher and intellectual property rights relating solely to plazomicin are owned by us. In addition, each party retains ownership of certain background intellectual property and improvements thereto.

Under the Assay Agreement, Thermo Fisher also has the worldwide exclusive rights to manufacture this assay during the period in which we continue to develop and commercialize plazomicin (unless the Assay Agreement is earlier terminated). Thermo Fisher also has the exclusive right to commercialize this assay under the Thermo Scientific name in each country in the territory in which we are commercializing plazomicin, for as long as we are commercializing plazomicin in such country. We are required to prioritize the promotion of the assay developed under the Assay Agreement relative to the promotion of any other assay capable of measuring plazomicin in certain countries, including the United States, Japan and Europe, so long as Thermo Fisher is capable of providing sufficient supply of the assay. The Assay Agreement further requires us to make certain annual payments to Thermo Fisher if commercialization targets are not met during certain periods following commercialization. If Thermo Fisher abandons its commercialization of the assay, Thermo Fisher is required to negotiate an agreement for the continued supply of the assay to us or our distributor.

The term of the Assay Agreement continues until we cease development and commercialization of plazomicin. Either we or Thermo Fisher may terminate the Assay Agreement for the other party's uncured material breach or bankruptcy (or similar event), and we may terminate without cause upon sixty days' written notice to Thermo Fisher. If we terminate the Assay Agreement without cause or Thermo Fisher terminates the Assay Agreement for cause prior to the payment of all milestone payments, we must pay to Thermo Fisher a sum equal to the amount that would have been due if the next applicable milestone had been achieved, provided that no payment will be due if we terminate the agreement at will in connection with the failure to obtain or maintain regulatory approval for plazomicin. If, within two years following the termination of the Assay Agreement by us at will or by Thermo Fisher for cause, we decide to develop and commercialize plazomicin, subject to certain conditions and limitations, we and Thermo Fisher are required to use good faith efforts to negotiate an agreement for the continued development, manufacture, supply and sale of the assay by Thermo Fisher on commercially reasonably terms, but we would have no duty to enter into any new agreement with Thermo Fisher and we would not be prohibited from negotiating or entering into an agreement with a third party for the development, manufacture, supply or sale of any assay.

Hovione Limited Commercial Manufacturing Agreement

In March 2017, we entered into a commercial validation and manufacturing agreement (the "Commercial Manufacturing Agreement") with Hovione Limited ("Hovione"). Under the Commercial Manufacturing Agreement, Hovione, an Ireland-based company with facilities in Portugal and Ireland that we intend to utilize, will carry out our validation program to validate and scale up our technology to manufacture the active pharmaceutical ingredient of plazomicin. The Commercial Manufacturing Agreement also includes the manufacture of commercial quantities of the

active pharmaceutical ingredient using the validated technology on a commercial scale at Hovione's facilities. We are required to purchase at least 80% of our total supply of plazomicin from Hovione for the first three years after approval. In addition, we have minimum annual purchase commitments from Hovione that start in 2020. The Commercial Manufacturing Agreement has an initial term of seven years after the first delivery of product.

Competition

The pharmaceutical industry is very competitive and subject to rapid and significant innovation. Our potential competitors include major multinational pharmaceutical companies, established biotechnology companies, specialty pharmaceutical and generic drug companies, universities, and other research institutions. Many of our competitors have greater financial resources, as well as larger research and development staff and more experienced marketing and manufacturing organizations. As a result, these companies may obtain regulatory approval more rapidly than we are able to and may be more effective in selling and marketing their products. Smaller or early-stage companies may also prove to be significant competitors, particularly through collaborative arrangements with large, established companies. Our competitors may succeed in developing, acquiring or licensing technologies and drug products that are superior to, or more effectively marketed than, plazomicin or any other drug candidate that we are currently developing or that we may develop, which could render our products obsolete and noncompetitive.

The competition in the antibiotics market is intense. Our goal is to establish plazomicin as a leader in the treatment of serious bacterial infections due to MDR Enterobacteriaceae, including CRE. Our clinical development program supports plazomicin's differentiated profile from both approved and development-stage antibacterials by focusing on the treatment of serious bacterial infections due to MDR Enterobacteriaceae in patients with limited or no alternative treatment options, including patients with cUTI or AP. If approved, plazomicin will face competition from commercially available antibiotics such as tigecycline, which is marketed by Pfizer as Tygacil, ceftazidime-avibactam, which is marketed in the United States by Allergan plc as Avycaz, other aminoglycosides that are generically available (e.g., gentamicin, amikacin, tobramycin), and polymyxins that are generically available (colistin and polymyxin B).

In addition, if approved, plazomicin may face additional competition from antibiotics currently in clinical development. We are aware of other antibiotics currently in development. Allergan plc and Pfizer Inc. continue development of ceftazidime/avibactam (already marketed in the United States) and ceftaroline/avibactam for pneumonia and complicated urinary and intra-abdominal infections. Tetraphase Pharmaceuticals, Inc. is developing eravacycline for cUTI and intra-abdominal infections, though eravacycline failed to meet its primary endpoint in a recently completed Phase 3 trial in cUTI. The Medicines Company is developing Carbavance™ for cUTIs and MDR gram-negative infections, including CRE. Merck & Co., Inc. is developing relebactam + imipenem/cilastatin for complicated urinary and intra-abdominal infections and pneumonia. Pfizer and Allergan are developing aztreonam-avibactam for certain life-threatening infections caused by MDR strains, including infections due to metallo-â-lactamase producing gram-negative pathogens. Zavante Therapeutics, Inc. is developing ZTI-01 for cUTI and Shionogi is developing cefiderocol for carbapenem-resistant gram-negative pathogens.

If approved, we believe that plazomicin would compete effectively against both marketed and known pipeline competitors based on the following:

- Potent in vitro and in vivo activity in nonclinical studies against MDR Enterobacteriaceae, including CRE;
- Activity in the presence of a range of resistance mechanisms, including most aminoglycoside modifying enzymes, fluoroquinolone target site mutations, extended-spectrum -lactamases, and carbapenemases;
- Demonstration of similar efficacy to levofloxacin and acceptable safety in a Phase 2 clinical trial in patients with cUTI infections caused primarily by non-resistant Enterobacteriaceae;
- Demonstration of non-inferiority to meropenem at day 5 and superiority to meropenem at day 17 in patients with cUTI/AP infections due to Enterobacteriaceae, including fluoroquinolone resistant and ESBL-producing isolates;
- Improved efficacy, overall mortality and safety of plazomicin versus colistin in patients with serious bacterial infections due to CRE, based on results observed in CARE study;
- Potential to individualize patient dosing using our in vitro drug-monitoring assay to optimize efficacy and safety of plazomicin therapy in bloodstream infections or pneumonia;

- Potential for more convenient administration as a once-daily, 30-minute IV therapy compared to other IV antibiotics administered multiple times per day with infusion times up to two hours; and
- Potential to reduce the healthcare costs associated with the treatment of such infections.

If we are unable to demonstrate these or other advantages of plazomicin over competing drugs and drug candidates, we may not be able to successfully commercialize plazomicin and our results of operations may suffer. Established pharmaceutical companies may also invest heavily to accelerate discovery and development of novel compounds or to in-license novel compounds that could make plazomicin or any other product candidates that we develop obsolete. As a result of all of these factors, our competitors may succeed in obtaining patent protection and/or regulatory approval or discovering, developing and commercializing antibiotics before we do.

Intellectual Property

The proprietary nature of, and protection for, our product candidates and our discovery programs, processes and know-how are important to our business. We have sought patent protection in the United States and certain other jurisdictions for plazomicin, LpxC inhibitors, and certain other inventions to which we have rights, where available and when appropriate. Our policy is to pursue, maintain and defend patent rights, whether developed internally or licensed from third parties, and to protect the technology, inventions and improvements that are commercially important to the development of our business. We also rely on trade secrets relating to our proprietary technology platform that may be important to the development of our business.

Our commercial success will depend in part on obtaining and maintaining patent protection and trade secret protection for our current and future product candidates and the methods used to develop and manufacture them, as well as successfully defending these patents against third-party challenges. Patents, issued or applied for, can cover inventions ranging from research compounds and techniques to processes related to specific products to the products themselves. Our issued patents extend for varying periods according to the date of patent application filing or grant and the legal term of patents in the various countries where patent protection is obtained. The actual protection afforded by a patent, which can vary from country to country, depends upon the type of patent, the scope of its coverage as determined by the patent office or courts in the country, and the availability of legal remedies in the country. We have applications or patents on platform technologies and methods of using our products (in either case, that may relate to classes of products or methods), that may confer additional patent protection but are not necessarily a protection against competition.

Our ability to stop third parties from making, using, selling, offering to sell, or importing our products depends in part on the extent to which we have rights under valid and enforceable patents or trade secrets that cover our activities. We cannot be sure that patents will be granted with respect to any of our pending patent applications or with respect to any patent applications filed by us in the future, nor can we be sure that any of our existing patents or any patents that may be granted to us in the future will be commercially useful in protecting our product candidates, discovery programs and processes. For this and more comprehensive risks related to our intellectual property, see “Risk Factors—Risks Related to Intellectual Property.”

We consider that in the aggregate our patent applications, patents and licenses under patents owned by third parties are of material importance to our operations. For our lead product, plazomicin, we have identified in the following paragraph the patents that are owned or controlled by Achaogen having claims directed to product-specific compositions of matter. This paragraph does not identify all patents or applications that may relate to plazomicin but are not material. We also have pending patent applications or applications we continue to file that may give rise to new patents relating to plazomicin. In part due to the early stage of our other research and development, we do not consider any of our additional patents or patent applications are material at this time and it is unclear what, if any, patent protection we will have for the ultimate products we choose to move forward through development.

Plazomicin (Aminoglycoside)

The patent portfolio for plazomicin is based upon an Achaogen-owned patent family that includes patents and patent applications directed to plazomicin and structural analogs thereof, pharmaceutical compositions containing plazomicin or analogs thereof, and methods of using plazomicin or analogs thereof in the treatment of bacterial infections. As of January 31, 2017, this patent family included two U.S. patents (U.S. Patent No. 8,383,596, issued

February 26, 2013, and U.S. Patent No. 8,822,424, issued September 2, 2014, and U.S. Patent No 9,266,919, issued February 23, 2016, which we refer to herein as the ‘596, ‘424 and ‘919 patents, respectively), and corresponding foreign patents and patent applications. As of January 31, 2017, we had corresponding granted patent or patents in Australia, Canada, China, Eurasia, Europe (generally, with country-specific validations ongoing), Israel, Japan, Korea, Mexico and Taiwan. In addition, as of January 31, 2017, we had corresponding patent applications pending in Brazil, Europe, and India. With the exception of the ‘596 patent, which the USPTO has determined is entitled to 923 days of patent term adjustment, we expect any U.S. and foreign patents in this patent family to expire in November 2028. In view of the USPTO determination that the ‘596 patent is entitled to 923 days of patent term adjustment, we expect the ‘596 patent would expire at its earliest on June 2031.

It is possible, assuming that plazomicin achieves regulatory approval and depending upon the date of any such approval, that the term of the ‘596 patent may be extended up to the lesser of (i) up to five additional years or (ii) no more than fourteen years from plazomicin’s approval date, under the provisions of the Drug Price Competition and Patent Term Restoration Act of 1984, also referred to as the Hatch-Waxman Act. Plazomicin could also qualify for pediatric exclusivity, which can be obtained during the approval process or after approval, and effectively delays the approval of a generic application until six months after the expiration of any patent or other exclusivity that would otherwise delay approval, thus providing an additional six months without generic competition. In order to qualify for pediatric exclusivity, the FDA must make a written request for pediatric studies, the application holder must agree to the request and complete the studies within the required timeframe, and the studies must be accepted by the FDA based on a determination that the studies fairly respond to the request.

Patent term extension and supplementary protection certificates also may be available in certain foreign countries upon regulatory approval. Additional intellectual property, including patent, protection may protect plazomicin in areas including but not limited to method of use, manufacturing, and platform technologies.

Additional Patent Positions

Our C-Scape program was created at Achaogen and we are pursuing intellectual property relating to this program. C-Scape is not covered by any issued patents.

Our patent portfolio for antipseudomonal LpxC inhibitor compounds is comprised of four distinct patent families. Three of these patent families are Achaogen-owned, and one is in-licensed from the University of Washington (“UW”) and co-owned by UW with Novartis Corp. The four patent families could support patents that would be set to expire between June 2028 and January 2024. If we are successful in developing and obtaining regulatory approval of an antipseudomonal LpxC inhibitor, the term of one U.S. patent issuing from one of our Achaogen-owned patent application families that covers such approved product may be eligible for up to five years of patent term extension under the provisions of the Hatch-Waxman Act. Patent term extension also may be available in certain foreign jurisdictions upon regulatory approval.

Trade Secrets

In addition to patents, we rely on trade secrets and know-how to develop and maintain our competitive position. We seek to protect our proprietary data and processes, in part, by confidentiality agreements and invention assignment agreements with our employees, consultants, scientific advisors, contractors, and partners. These agreements are designed to protect our proprietary information. We also seek to preserve the integrity and confidentiality of our data, trade secrets and know-how by maintaining physical security of our premises and physical and electronic security of our information technology systems. Trade secrets and know-how can be difficult to protect. Consequently, we anticipate that trade secrets and know-how will, over time, be disseminated within the industry through independent development, the publication of journal articles, and the movement of personnel skilled in the art from academic to

industry scientific positions.

Government Regulation and Product Approval

Government authorities in the United States, at the federal, state and local level, and in other countries extensively regulate, among other things, the research, development, testing, manufacture, including any manufacturing changes, packaging, storage, recordkeeping, labeling, advertising, promotion, distribution, marketing, import and export of pharmaceutical products such as those we are developing. The processes for obtaining regulatory approvals in the United States and in foreign countries, along with subsequent compliance with

appropriate federal, state, local and foreign statutes and regulations, require the expenditure of substantial time and financial resources.

U.S. Government Regulation

In the United States, the FDA regulates drugs under the Federal Food, Drug, and Cosmetic Act ("FDCA"), and its implementing regulations. The process of obtaining regulatory approvals and the subsequent compliance with appropriate federal, state, local and foreign statutes and regulations requires the expenditure of substantial time and financial resources. Failure to comply with the applicable U.S. requirements at any time during the product development process, approval process or after approval, may subject an applicant to a variety of administrative or judicial sanctions, such as the FDA's refusal to approve pending NDAs, withdrawal of an approval, imposition of a clinical hold, issuance of warning letters, product recalls, product seizures, total or partial suspension of production or distribution, injunctions, fines, refusals of government contracts, restitution, disgorgement or civil or criminal penalties.

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

- completion of preclinical laboratory tests, animal studies and formulation studies in compliance with the FDA's good laboratory practice regulations;
- submission to the FDA of an IND which must become effective before human clinical trials may begin;
- approval by an independent institutional review board ("IRB"), at each clinical site before each trial may be initiated;
- performance of adequate and well-controlled human clinical trials in accordance with good clinical practice ("GCP"), requirements to establish the safety and efficacy of the proposed drug product for each indication;
- submission to the FDA of an NDA;
- satisfactory completion of an FDA advisory committee review, if applicable;
- satisfactory completion of an FDA inspection of the manufacturing facility or facilities at which the product is produced to assess compliance with current good manufacturing practice ("cGMP"), requirements and to assure that the facilities, methods and controls are adequate to preserve the drug's identity, strength, quality and purity;
- satisfactory completion of preapproval audits of selected clinical sites, clinical trial vendors and sponsor facilities to ensure that the clinical trials upon which the approval will be based have been conducted in accordance with Good Clinical Practices and consistent with regulations for the protection of human subject rights described in 21CFR50; and
- FDA review and approval of the NDA.

Preclinical Studies

Preclinical studies include laboratory evaluation of product chemistry, toxicity and formulation, as well as animal studies to assess potential safety and efficacy. An IND sponsor must submit the results of the preclinical tests, together with manufacturing information, analytical data and any available clinical data or literature, among other things, to the FDA as part of an IND. Some preclinical testing may continue even after the IND is submitted. An IND automatically becomes effective 30 days after receipt by the FDA, unless before that time the FDA raises concerns or questions related to one or more proposed clinical trials and places the clinical trial on a clinical hold. In such a case, the IND sponsor and the FDA must resolve any outstanding concerns before the clinical trial can begin. As a result, submission of an IND may not result in the FDA allowing clinical trials to commence. In 2008, we submitted our first IND to the FDA for plazomicin. We also previously submitted an IND to the FDA for ACHN-

975 in 2012; however, as described above this IND was withdrawn in May 2014 following termination of the clinical program for this compound.

Clinical Trials

Clinical trials involve the administration of the investigational new drug to human subjects under the supervision of qualified investigators in accordance with GCP requirements, which include the requirement that all research subjects provide their informed consent in writing for their participation in any clinical trial. Clinical trials are conducted under protocols detailing, among other things, the objectives of the trial, the parameters to be used in monitoring safety, and the effectiveness criteria to be evaluated. A protocol for each clinical trial and any subsequent protocol amendments must be submitted to the FDA as part of the IND. In addition, an IRB at each institution participating in the clinical trial must review and approve the plan for any clinical trial before it commences at that institution. Information about certain clinical trials must be submitted within specific timeframes to NIH, for public dissemination on their www.clinicaltrials.gov website.

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

- Phase 1: The drug is initially introduced into healthy human subjects or patients with the target disease or condition and tested for safety, dosage tolerance, absorption, metabolism, distribution, excretion and, if possible, to gain an early indication of its effectiveness.
- Phase 2: The drug is administered to a limited patient population to identify possible adverse effects and safety risks, to preliminarily evaluate the efficacy of the product for specific targeted diseases and to determine dosage tolerance and optimal dosage.
- Phase 3: The drug is administered to an expanded patient population, generally at geographically dispersed clinical trial sites, in well-controlled clinical trials to generate enough data to statistically evaluate the efficacy and safety of the product for approval, to establish the overall risk-benefit profile of the product, and to provide adequate information for the labeling of the product.

Progress reports detailing the results of the clinical trials must be submitted at least annually to the FDA and more frequently if serious adverse events occur. Phase 1, Phase 2 and Phase 3 clinical trials may not be completed successfully within any specified period, or at all. Furthermore, the FDA or the sponsor may suspend or terminate a clinical trial at any time on various grounds, including a finding that the research subjects are being exposed to an unacceptable health risk. Similarly, an IRB can suspend or terminate approval of a clinical trial at its institution if the clinical trial is not being conducted in accordance with the IRB's requirements or if the drug has been associated with unexpected serious harm to patients.

Marketing Approval

Assuming successful completion of the required clinical testing, the results of the preclinical and clinical studies, together with detailed information relating to the product's chemistry, manufacture, controls and proposed labeling, among other things, are submitted to the FDA as part of an NDA requesting approval to market the product for one or more indications. In most cases, the submission of an NDA is subject to a substantial application user fee. Under the Prescription Drug User Fee Act ("PDUFA"), guidelines that are currently in effect, the FDA has a goal of ten months from the date of "filing" of a standard NDA for a new molecular entity to review and act on the submission. This review typically takes twelve months from the date the NDA is submitted to FDA because the FDA has approximately two months to make a "filing" decision.

In addition, under the Pediatric Research Equity Act of 2003, as amended and reauthorized, certain NDAs or supplements to an NDA must contain data that are adequate to assess the safety and effectiveness of the drug for the claimed indications in all relevant pediatric subpopulations, and to support dosing and administration for each

pediatric subpopulation for which the product is safe and effective. The FDA may, on its own initiative or at the request of the applicant, grant deferrals for submission of some or all pediatric data until after approval of the product for use in adults, or full or partial waivers from the pediatric data requirements.

The FDA also may require submission of a risk evaluation and mitigation strategy, or REMS, plan to ensure that the benefits of the drug outweigh its risks. The REMS plan could include medication guides, physician

communication plans, assessment plans, and/or elements to assure safe use, such as restricted distribution methods, patient registries, or other risk minimization tools.

The FDA conducts a preliminary review of all NDAs within the first 60 days after submission, before accepting them for filing, to determine whether they are sufficiently complete to permit substantive review. The FDA may request additional information rather than accept an NDA for filing. In this event, the application must be resubmitted with the additional information. The resubmitted application is also subject to review before the FDA accepts it for filing. Once the submission is accepted for filing, the FDA begins an in-depth substantive review. The FDA reviews an NDA to determine, among other things, whether the drug is safe and effective and whether the facility in which it is manufactured, processed, packaged or held meets standards designed to assure the product's continued safety, quality and purity.

The FDA may refer an application for a novel drug to an advisory committee. An advisory committee is a panel of independent experts, including clinicians and other scientific experts, that reviews, evaluates and provides a recommendation as to whether the application should be approved and under what conditions. The FDA is not bound by the recommendations of an advisory committee, but it considers such recommendations carefully when making decisions.

Before approving an NDA, the FDA typically will inspect the facility or facilities where the product is manufactured. The FDA will not approve an application unless it determines that the manufacturing processes and facilities are in compliance with cGMP requirements and adequate to assure consistent production of the product within required specifications. Additionally, before approving an NDA, the FDA may inspect one or more clinical trial sites to assure compliance with GCP requirements.

The FDA generally accepts data from foreign clinical trials in support of an NDA if the trials were conducted under an IND. If a foreign clinical trial is not conducted under an IND, the FDA nevertheless may accept the data in support of an NDA if the study was conducted in accordance with GCP requirements and the FDA is able to validate the data through an on-site inspection, if deemed necessary. Although the FDA generally requests that marketing applications be supported by some data from domestic clinical studies, the FDA may accept foreign data as the sole basis for marketing approval if (1) the foreign data are applicable to the U.S. population and U.S. medical practice, (2) the studies were performed by clinical investigators with recognized competence, and (3) the data may be considered valid without the need for an on-site inspection or, if the FDA considers the inspection to be necessary, the FDA is able to validate the data through an on-site inspection or other appropriate means.

The testing and approval process for an NDA requires substantial time, effort and financial resources, and each may take several years to complete. Data obtained from preclinical and clinical testing are not always conclusive and may be susceptible to varying interpretations, which could delay, limit or prevent regulatory approval. The FDA may not grant approval on a timely basis, or at all.

After evaluating the NDA and all related information, including the advisory committee recommendation, if any, and inspection reports regarding the manufacturing facilities and clinical trial sites, the FDA may issue an approval letter, or, in some cases, a complete response letter. A complete response letter generally contains a statement of specific conditions that must be met in order to secure final approval of the NDA and may require additional clinical or preclinical testing in order for FDA to reconsider the application. Even with submission of this additional information, the FDA ultimately may decide that the application does not satisfy the regulatory criteria for approval. If and when those conditions have been met to the FDA's satisfaction, the FDA will typically issue an approval letter. An approval letter authorizes commercial marketing of the drug with specific prescribing information for specific indications.

Even if the FDA approves a product, it may limit the approved indications for use of the product, require that contraindications, warnings or precautions be included in the product labeling, require that post-approval studies, including Phase 4 clinical trials, be conducted to further assess a drug's safety after approval, require testing and surveillance programs to monitor the product after commercialization, or impose other conditions, including distribution and use restrictions or other risk management mechanisms under a REMS, which can materially affect the potential market and profitability of the product. The FDA may prevent or limit further marketing of a product based on the results of post-marketing studies or surveillance programs. After approval, some types of changes to

the approved product, such as adding new indications, manufacturing changes, and additional labeling claims, are subject to further testing requirements and FDA review and approval.

Special FDA Expedited Review and Approval Programs

The FDA has various programs, including fast-track designation, accelerated approval and priority review, that are intended to expedite or simplify the process for the development and FDA review of drugs that are intended for the treatment of serious or life threatening diseases or conditions and demonstrate the potential to address unmet medical needs. The purpose of these programs is to provide important new drugs to patients earlier than under standard FDA review procedures.

To be eligible for a fast-track designation, the FDA must determine, based on the request of a sponsor, that a product is intended to treat a serious or life-threatening disease or condition and demonstrates the potential to address an unmet medical need, or that the drug qualifies as a QIDP under the GAIN Act. The FDA will determine that a product will fill an unmet medical need if it will provide a therapy where none exists or provide a therapy that may be potentially superior to existing therapy based on efficacy or safety factors. The FDA may review sections of the NDA for a fast-track product on a rolling basis before the complete application is submitted, if the sponsor provides a schedule for the submission of the sections of the NDA, the FDA agrees to accept sections of the NDA and determines that the schedule is acceptable, and the sponsor pays any required user fees upon submission of the first section of the NDA.

The FDA may give a priority review designation to drugs that offer major advances in treatment, or provide a treatment where no adequate therapy exists, or that the drug qualifies as a QIDP under the GAIN Act. A priority review means that the goal for the FDA to review an application is six months, rather than the standard review of ten months under current PDUFA guidelines. Under the new PDUFA agreement, these six and ten month review periods are measured from the “filing” date rather than the receipt date for NDAs for new molecular entities, which typically adds approximately two months to the timeline for review and decision from the date of submission. Most products that are eligible for fast-track designation are also likely to be considered appropriate to receive a priority review.

In addition, products studied for their safety and effectiveness in treating serious or life-threatening illnesses and that provide meaningful therapeutic benefit over existing treatments may be eligible for accelerated approval and may be approved on the basis of adequate and well-controlled clinical trials establishing that the drug product has an effect on a surrogate endpoint that is reasonably likely to predict clinical benefit, or on a clinical endpoint that can be measured earlier than irreversible morbidity or mortality, that is reasonably likely to predict an effect on irreversible morbidity or mortality or other clinical benefit, taking into account the severity, rarity or prevalence of the condition and the availability or lack of alternative treatments. As a condition of approval, the FDA may require a sponsor of a drug receiving accelerated approval to perform post-marketing studies to verify and describe the predicted effect on irreversible morbidity or mortality or other clinical endpoint, and the drug may be subject to accelerated withdrawal procedures.

Moreover, under the provisions of the FDASIA, passed in July 2012, a sponsor can request designation of a product candidate as a “breakthrough therapy.” A breakthrough therapy is defined as a drug that is intended, alone or in combination with one or more other drugs, to treat a serious or life-threatening disease or condition, and preliminary clinical evidence indicates that the drug may demonstrate substantial improvement over existing therapies on one or more clinically significant endpoints, such as substantial treatment effects observed early in clinical development. Drugs designated as breakthrough therapies are also eligible for the other expedited review and approval programs, including accelerated approval, priority review, and fast-track designation. The FDA must take certain actions, such as holding timely meetings and providing advice, intended to expedite the development and review of an application for approval of a breakthrough therapy.

Even if a product qualifies for one or more of these programs, the FDA may later decide that the product no longer meets the conditions for qualification or decide that the time period for FDA review or approval will not be shortened.

We received fast-track designation from the FDA for plazomicin in August 2012.

Post-Approval Requirements

Drugs manufactured or distributed pursuant to FDA approvals are subject to pervasive and continuing regulation by the FDA, including, among other things, requirements relating to recordkeeping, periodic reporting, product sampling and distribution, advertising and promotion and reporting of adverse experiences with the product. After approval, most changes to the approved product, such as adding new indications or other labeling claims are subject to prior FDA review and approval. There also are continuing, annual user fee requirements for any marketed products and the establishments at which such products are manufactured, as well as new application fees for supplemental applications with clinical data.

The FDA may impose a number of post-approval requirements as a condition of approval of an NDA. For example, the FDA may require post-marketing testing, including Phase 4 clinical trials, and surveillance to further assess and monitor the product's safety and effectiveness after commercialization.

In addition, drug manufacturers and other entities involved in the manufacture and distribution of approved drugs are required to register their establishments with the FDA and state agencies, and are subject to periodic unannounced inspections by the FDA and these state agencies for compliance with cGMP requirements. Changes to the manufacturing process are strictly regulated and often require prior FDA approval before being implemented. FDA regulations also require investigation and correction of any deviations from cGMP requirements and impose reporting and documentation requirements upon the sponsor and any third-party manufacturers that the sponsor may decide to use. Accordingly, manufacturers must continue to expend time, money, and effort in the area of production and quality control to maintain cGMP compliance.

Once an approval is granted, the FDA may withdraw the approval if compliance with regulatory requirements and standards is not maintained or if problems occur after the product reaches the market.

Later discovery of previously unknown problems with a product, including adverse events of unanticipated severity or frequency, or with manufacturing processes, or failure to comply with regulatory requirements, may result in mandatory revisions to the approved labeling to add new safety information; imposition of post-market studies or clinical trials to assess new safety risks; or imposition of distribution or other restrictions under a REMS program. Other potential consequences include, among other things:

- restrictions on the marketing or manufacturing of the product, complete withdrawal of the product from the market or product recalls;
- fines, warning letters or holds on post-approval clinical trials;
- refusal of the FDA to approve pending NDAs or supplements to approved NDAs, or suspension or revocation of product license approvals;
- product seizure or detention, or refusal to permit the import or export of products; or
- injunctions or the imposition of civil or criminal penalties.

The FDA strictly regulates marketing, labeling, advertising and promotion of products that are placed on the market. Drugs may be promoted only for the approved indications and in accordance with the provisions of the approved label. The FDA and other agencies actively enforce the laws and regulations prohibiting the promotion of off-label uses, and a company that is found to have improperly promoted off-label uses may be subject to significant liability.

In addition, the distribution of prescription pharmaceutical products is subject to the Prescription Drug Marketing Act ("PDMA"), which regulates the distribution of drugs and drug samples at the federal level, and sets minimum standards for the registration and regulation of drug distributors by the states. Both the PDMA and state laws limit the distribution of prescription pharmaceutical product samples and impose requirements to ensure accountability in

distribution.

505(b)(2) Regulatory Pathway

As an alternative path to FDA approval for modifications to formulations or uses of products previously approved by the FDA, an applicant may submit an NDA under Section 505(b)(2) of the FDCA. Section 505(b)(2) was enacted as part of the Hatch-Waxman Amendments and permits the filing of an NDA where at least some of the information required for approval comes from studies not conducted by, or for, the applicant and for which the applicant has not obtained a right of reference. If the 505(b)(2) applicant can establish that reliance on FDA's previous findings of safety and effectiveness is scientifically appropriate, it may eliminate the need, or reduce the requirements, to conduct certain preclinical or clinical studies of the new product. The FDA may also require companies to perform additional studies or measurements, including clinical trials, to support the change from the approved branded reference drug(s). The FDA may then approve the new product candidate for all, or some, of the label indications for which the branded reference drug has been approved, as well as for any new indication sought by the 505(b)(2) applicant. We plan to pursue a 505(b)(2) regulatory pathway for C-Scape.

Exclusivity and Approval of Competing Products

Orange Book Listing

In seeking approval for a drug through an NDA, including a 505(b)(2) NDA, applicants are required to list with the FDA certain patents whose claims cover the applicant's product. Upon approval of an NDA, each of the patents listed in the application for the drug is then published in the Orange Book. Any applicant who files a 505(b)(2) NDA referencing a drug listed in the Orange Book must certify to the FDA that (1) no patent information on the drug product that is the subject of the application has been submitted to the FDA; (2) such patent has expired; (3) the date on which such patent expires; or (4) such patent is invalid or will not be infringed upon by the manufacture, use or sale of the drug product for which the application is submitted. This last certification is known as a paragraph IV certification. A notice of the paragraph IV certification must be provided to each owner of the patent that is the subject of the certification and to the holder of the approved NDA to which the 505(b)(2) application refers. The applicant may also elect to submit a ''section viii'' statement certifying that its proposed label does not contain (or carves out) any language regarding the patented method-of-use rather than certify to a listed method-of-use patent. If the reference NDA holder and patent owners assert a patent challenge directed to one of the Orange Book listed patents within 45 days of the receipt of the paragraph IV certification notice, the FDA is prohibited from approving the application until the earlier of 30 months from the receipt of the paragraph IV certification expiration of the patent, settlement of the lawsuit or a decision in the infringement case that is favorable to the applicant. A 505(b)(2) application also will not be approved until any applicable non-patent exclusivity listed in the Orange Book for the branded reference drug has expired as described in further detail below.

Hatch-Waxman Exclusivity

Market and data exclusivity provisions under the FDCA can delay the submission or the approval of certain applications for competing products. The FDCA provides a five-year period of non-patent data exclusivity within the United States to the first applicant to gain approval of an NDA for a new chemical entity. A drug is a new chemical entity if the FDA has not previously approved any other new drug containing the same active moiety, which is the molecule or ion responsible for the activity of the drug substance. We believe that our product candidate plazomicin is a new chemical entity. During the exclusivity period, the FDA may not accept for review an abbreviated new drug application ("ANDA"), or a 505(b)(2) NDA submitted by another company that references the previously approved drug. However, an ANDA or 505(b)(2) NDA may be submitted after four years if it contains a certification of patent invalidity or non-infringement. The FDCA also provides three years of marketing exclusivity for an NDA, 505(b)(2) NDA, or supplement to an existing NDA or 505(b)(2) NDA if new clinical investigations, other than bioavailability studies, that were conducted or sponsored by the applicant, are deemed by the FDA to be essential to the approval of the application or supplement. Three-year exclusivity may be awarded for changes to a previously approved drug product, such as new indications, dosages, strengths or dosage forms of an existing drug. This three-year exclusivity

covers only the conditions of use associated with the new clinical investigations and, as a general matter, does not prohibit the FDA from approving ANDAs or 505(b)(2) NDAs for generic versions of the original, unmodified drug product. Five-year and three-year exclusivity will not delay the submission or approval of a full NDA; however, an applicant submitting a full NDA would be required to conduct or obtain a right of reference to all of the preclinical studies and adequate and well-controlled clinical trials necessary to demonstrate safety and effectiveness. For drug products that contain an “antibiotic” ingredient approved prior to November 21,1997, the statute imposes certain limitations on the award of five-year non-patent exclusivity. However, we do not believe these limitations would apply to any of our investigational antibiotics.

Qualified Infectious Disease Product Exclusivity

Under the GAIN Act provisions of FDASIA, which was signed into law in July 2012, the FDA may designate a product as a "qualified infectious disease product" ("QIDP"). In order to receive this designation, a drug must qualify as an antibacterial or antifungal drug for human use intended to treat serious or life-threatening infections, including those caused by either (1) an antibacterial or antifungal resistant pathogen, including novel or emerging infectious pathogens, or (2) a so-called "qualifying pathogen" found on a list of potentially dangerous, drug-resistant organisms to be established and maintained by the FDA under the new law. A sponsor must request such designation before submitting a marketing application. FDA granted qualified infectious disease product designation for plazomicin for the treatment of hospital-acquired bacterial pneumonia, ventilator-associated pneumonia, complicated intra-abdominal infections, complicated urinary tract infections, and catheter-related bloodstream infections on December 14, 2014. FDA also granted QIDP designation to C-Scape in January 2017.

The benefits of QIDP designation include eligibility for priority review and an extension by an additional five years of any non-patent marketing exclusivity period awarded, such as a five-year exclusivity period awarded for a new molecular entity. This extension is in addition to any pediatric exclusivity extension that may be awarded, and the extension will be awarded only to a drug first approved on or after the date of enactment.

The GAIN Act provisions prohibit the grant of an exclusivity extension where the application is a supplement to an application for which an extension is in effect or has expired, is a subsequent application for a specified change to an approved product, or is an application for a product that does not meet the definition of qualified infectious disease product based on the uses for which it is ultimately approved.

Foreign Regulation

In order to market any product outside of the United States, we would need to comply with numerous and varying regulatory requirements of other countries regarding safety and efficacy and governing, among other things, clinical trials, marketing authorization, commercial sales and distribution of our products. For example, in the EU, we must obtain authorization of a clinical trial application, in each member state in which we intend to conduct a clinical trial. Whether or not we obtain FDA approval for a product, we would need to obtain the necessary approvals by the comparable regulatory authorities of foreign countries before we can commence clinical trials or marketing of the product in those countries. The approval process varies from country to country and can involve additional product testing and additional administrative review periods. The time required to obtain approval in other countries might differ from and be longer than that required to obtain FDA approval. 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.

To obtain a marketing authorization of a drug in the EU, we may submit marketing authorization applications, either under the so-called centralized or national authorization procedures.

Centralized Procedure

The centralized procedure provides for the grant of a single marketing authorization following a favorable opinion by the EMA that is valid in all EU member states, as well as Iceland, Liechtenstein and Norway. The centralized procedure is compulsory for medicines produced by specified biotechnological processes, products designated as orphan medicinal products, and products with a new active substance indicated for the treatment of specified diseases, such as HIV/AIDS, cancer, diabetes, neurodegenerative disorders or autoimmune diseases and other immune dysfunctions. The centralized procedure is optional for products that represent a significant therapeutic, scientific or technical innovation, or whose authorization would be in the interest of public health. Under the centralized procedure

the maximum timeframe for the evaluation of an MAA by the EMA is 210 days, excluding clock stops, when additional written or oral information is to be provided by the applicant in response to questions asked by the Committee of Medicinal Products for Human Use ("the CHMP"). Accelerated assessment might be granted by the CHMP in exceptional cases, when a medicinal product is expected to be of a major public health interest, particularly from the point of view of therapeutic innovation. The timeframe for the evaluation of an MAA under the accelerated assessment procedure is of 150 days, excluding stop-clocks.

National Authorization Procedures

There are also two other possible routes to authorize medicinal products in several EU countries, which are available for investigational medicinal products that fall outside the scope of the centralized procedure:

- Decentralized procedure. Using the decentralized procedure, an applicant may apply for simultaneous authorization in more than one EU country of medicinal products that have not yet been authorized in any EU country and that do not fall within the mandatory scope of the centralized procedure.
- Mutual recognition procedure. In the mutual recognition procedure, a medicine is first authorized in one EU Member State, in accordance with the national procedures of that country. Following this, further marketing authorizations can be sought from other EU countries in a procedure whereby the countries concerned agree to recognize the validity of the original, national marketing authorization.

In the EU, new products authorized for marketing (i.e., reference products) qualify for eight years of data exclusivity and an additional two years of market exclusivity upon marketing authorization. The data exclusivity period prevents generic applicants from relying on the preclinical and clinical trial data contained in the dossier of the reference product when applying for a generic marketing authorization in the EU during a period of eight years from the date on which the reference product was first authorized in the EU. The market exclusivity period prevents a successful generic applicant from commercializing its product in the EU until ten years have elapsed from the initial authorization of the reference product in the EU. The ten-year market exclusivity period can be extended to a maximum of eleven years if, during the first eight years of those ten years, the marketing authorization holder obtains an authorization for one or more new therapeutic indications which, during the scientific evaluation prior to their authorization, are held to bring a significant clinical benefit in comparison with existing therapies.

Regulation of In Vitro Diagnostic Assays

In the United States, the FDCA and its implementing regulations, and other federal and state statutes and regulations govern, among other things, medical device design and development, preclinical and clinical testing, premarket clearance or approval, registration and listing, manufacturing, labeling, storage, advertising and promotion, sales and distribution, export and import, and post-market surveillance. Diagnostic tests are classified as medical devices under the FDCA. Unless an exemption applies, diagnostic tests require marketing clearance or approval from the FDA prior to commercial distribution. The two primary types of FDA marketing authorization applicable to a medical device are premarket notification, also called 510(k) clearance, and approval of a premarket approval application (“PMA”). The FDA classifies all medical devices into one of three classes. Devices deemed to pose lower risk are categorized as either Class I or II, which requires the manufacturer to submit to the FDA a 510(k) pre-market notification requesting clearance of the device for commercial distribution in the United States, unless an exemption applies. Devices deemed by the FDA to pose the greatest risk, such as life sustaining, life-supporting or implantable devices, or devices deemed not substantially equivalent to a previously 510(k)-cleared device are categorized as Class III, requiring a PMA.

To obtain 510(k) clearance for a medical device, a pre-market notification must be submitted to the FDA demonstrating that the proposed device is substantially equivalent to a previously 510(k)-cleared device or a device that was in commercial distribution before May 28, 1976 for which the FDA has not yet called for the submission of a PMA, or the device must be one that has been reclassified from Class III to either Class II or I. The 510(k) clearance process usually takes from three to twelve months from the date the application is submitted and filed with the FDA, but may take significantly longer and clearance is never assured. Although many 510(k) pre-market notifications are cleared without clinical data, in some cases, the FDA requires significant clinical data to support substantial equivalence. In reviewing a pre-market notification, the FDA may request additional information, including clinical data, which may significantly prolong the review process. After a device receives 510(k) clearance, any subsequent modification of the device that could significantly affect its safety or effectiveness, or that would constitute a major change in its intended use, will require a new 510(k) clearance or could require pre-market approval. The FDA

requires each manufacturer to make this determination initially, but the FDA may review any such decision and may disagree with a manufacturer's determination. If the FDA disagrees with a manufacturer's determination, the FDA may require the manufacturer to cease marketing and/or recall the modified device until 510(k) clearance or a PMA is obtained.

PMA applications must be supported by valid scientific evidence, which typically requires extensive data, including technical, preclinical, clinical and manufacturing data, to demonstrate to the FDA's satisfaction the safety and effectiveness of the device. For diagnostic tests, a PMA application typically includes data regarding analytical and clinical validation studies. As part of its review of the PMA, the FDA will conduct a pre-approval inspection of the manufacturing facility or facilities to ensure compliance with the Quality System Regulation ("QSR"), which requires manufacturers to follow design, testing, control, documentation and other quality assurance procedures. FDA review of an initial PMA application is required by statute to take between six to ten months, although the process typically takes longer, and may require several years to complete. If the FDA evaluations of both the PMA application and the manufacturing facilities are favorable, the FDA will either issue an approval letter or an approvable letter, which usually contains a number of conditions that must be met in order to secure the final approval of the PMA. If the FDA's evaluation of the PMA or manufacturing facilities is not favorable, the FDA will deny approval of the PMA or issue a not approvable letter. A not approvable letter will outline the deficiencies in the application and, where practical, will identify what is necessary to make the PMA approvable. The FDA may also determine that additional clinical trials are necessary, in which case the PMA approval may be delayed for several months or years while the trials are conducted and then the data submitted in an amendment to the PMA. Once granted, PMA approval may be withdrawn by the FDA if compliance with post-approval requirements, conditions of approval or other regulatory standards is not maintained or problems are identified following initial marketing.

We and our partner Microgenics (a part of Thermo Fisher Scientific, Inc.) ("Thermo Fisher") are developing an in vitro assay for plazomicin and will work together to generate the data required for submission of either a 510(k) submission or a PMA application. We will remain in close contact with the Center for Devices and Radiological Health ("CDRH"), at the FDA to ensure that any changes in requirements are incorporated into the development plans. We anticipate coordination between the Center for Drug Evaluation and Research ("CDER") and CDRH on the plazomicin in vitro assay submission, including assessment of the device risk category. The assay may be classified by the FDA as a companion diagnostic for plazomicin in association with the CRE population. On August 6, 2014, the FDA issued a final guidance document addressing the development and clearance or approval process for "In vitro Companion Diagnostic Devices." According to the guidance, for novel therapeutic products such as plazomicin, the companion diagnostic device should be developed and approved or cleared contemporaneously with the therapeutic. In the event our in vitro assay for plazomicin becomes classified as a companion diagnostic, we believe our development program is consistent with the guidance.

In the European Economic Area ("EEA"), in vitro medical devices are required to conform with the essential requirements of the EU Directive on in vitro diagnostic medical devices (Directive No 98/79/EC, as amended). To demonstrate compliance with the essential requirements, the manufacturer must undergo a conformity assessment procedure. The conformity assessment varies according to the type of medical device and its classification. For low-risk devices, the conformity assessment can be carried out internally, but for higher risk devices it requires the intervention of an accredited EEA Notified Body. If successful, the conformity assessment concludes with the drawing up by the manufacturer of an EC Declaration of Conformity entitling the manufacturer to affix the CE mark to its products and to sell them throughout the EEA. The data generated for the U.S. registration will be sufficient to satisfy the regulatory requirements for the EU and other countries.

Other Healthcare Laws

In addition to FDA restrictions on marketing of pharmaceutical products, federal and state healthcare laws govern certain business practices in the biopharmaceutical industry. These laws include, but are not limited to, anti-kickback, false claims, data privacy and security, and physician payment and drug pricing laws.

The federal Anti-Kickback Statute prohibits, among other things, any person from knowingly and willfully offering, paying, soliciting or receiving remuneration to induce or in return for purchasing, leasing, ordering, or arranging for or

recommending the purchase, lease, or order of any item or service reimbursable under Medicare, Medicaid or other federal healthcare programs. The term “remuneration” has been broadly interpreted to include anything of value. The Anti-Kickback Statute has been interpreted to apply to arrangements between pharmaceutical manufacturers on one hand and prescribers, purchasers, and formulary managers on the other hand. Although there are a number of statutory exceptions and regulatory safe harbors protecting some common activities from prosecution, the exemptions and safe harbors are drawn narrowly. Practices that involve remuneration that may be alleged to be intended to induce prescribing, purchases, or recommendations may be subject to scrutiny if they do not meet the requirements of a statutory or regulatory exception or safe harbor. Several courts have interpreted the

statute's intent requirement to mean that if any one purpose of an arrangement involving remuneration is to induce referrals of federal healthcare covered business, the statute has been violated.

The federal False Claims Act prohibits any person from knowingly presenting, or causing to be presented, a false claim for payment to the federal government, knowingly making, using, or causing to be made or used a false record or statement material to a false or fraudulent claim to the federal government, or from knowingly making a false statement to avoid, decrease or conceal an obligation to pay money to the federal government. A claim includes "any request or demand" for money or property presented to the U.S. government. Several pharmaceutical and other healthcare companies have been prosecuted under these laws for allegedly providing free product to customers with the expectation that the customers would bill federal programs for the product. Other companies have been prosecuted for causing false claims to be submitted because of the companies' marketing of products for unapproved, and thus non-covered, uses. In addition, many states have similar fraud and abuse statutes or regulations that apply to items and services reimbursed under Medicaid and other state programs, or, in several states, apply regardless of the payor.

The federal Health Insurance Portability and Accountability Act of 1996 ("HIPAA"), also created new federal criminal statutes that prohibit knowingly and willfully executing, or attempting to execute, a scheme to defraud any healthcare benefit program, including private third-party payors, knowingly and willfully embezzling or stealing from a healthcare benefit program, willfully obstructing a criminal investigation of a healthcare offense, and knowingly and willfully falsifying, concealing or covering up a material fact or making any materially false, fictitious or fraudulent statement in connection with the delivery of or payment for healthcare benefits, items or services. The Patient Protection and Affordable Care Act, as amended by the Health Care and Education Reconciliation Act (collectively, the ("ACA"), signed into law on March 2010, broadened the reach of both the Anti-Kickback Statute and the criminal healthcare fraud statute by amending the intent requirement such that a person or entity no longer needs to have actual knowledge of the statute or specific intent to violate it in order to have committed a violation. In addition, 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 civil False Claims Act or the civil monetary penalties statute, which imposes penalties against any person who is determined to have presented or caused to be presented a claim to a federal health program that the person knows or should know is for an item or service that was not provided as claimed or is false or fraudulent.

In addition, there has been a recent trend of increased federal and state regulation of payments made to physicians and other healthcare providers. ACA created new federal requirements for reporting, by applicable manufacturers of covered drugs, payments and other transfers of value to physicians and teaching hospitals. Applicable manufacturers are also required to report annually to the government certain ownership and investment interests held by physicians and their immediate family members. In addition, certain states require implementation of commercial compliance programs and compliance with the pharmaceutical industry's voluntary compliance guidelines and the relevant compliance guidance promulgated by the federal government, impose restrictions on marketing practices, and/or require the tracking and reporting of marketing expenditures and pricing information as well as gifts, compensation and other remuneration or items of value provided to physicians and other healthcare professionals and entities.

We may also be subject to data privacy and security regulation by both the federal government and the states in which we conduct our business. HIPAA, as amended by the Health Information Technology for Economic and Clinical Health Act ("HITECH"), and its implementing regulations, imposes specified requirements relating to the privacy, security and transmission of individually identifiable health information. Among other things, HITECH makes HIPAA's privacy and security standards directly applicable to "business associates," defined as independent contractors or agents of covered entities that create, receive, maintain or transmit protected health information in connection with providing a service on behalf of a covered entity. HITECH also increased the civil and criminal penalties that may be imposed against covered entities, business associates and possibly other persons, and gave state attorneys general new authority to file civil actions for damages or injunctions in federal courts to enforce the federal HIPAA laws and seek

attorney's fees and costs associated with pursuing federal civil actions. In addition, state laws govern the privacy and security of health information in certain circumstances, many of which differ from each other in significant ways and may not have the same requirements, thus complicating compliance efforts.

To the extent that any of our product candidates, once approved, are sold in a foreign country, we may be subject to similar foreign laws and regulations, which may include, for instance, applicable post-marketing

requirements, including safety surveillance, anti-fraud and abuse laws, and implementation of corporate compliance programs and reporting of payments or other transfers of value to healthcare professionals.

Coverage and Reimbursement

At launch we expect plazomicin to be utilized within the hospital environment and therefore, our customers to be reimbursed under a prospective payment system, or a predetermined payment amount that is based on the diagnosis related groups ("DRGs") for Medicare patients and under a bundled payment for commercially insured patients. These payment amounts differ by type of diagnoses, procedures and the severity of the patient's condition, among other things. Typically the cost of treatment for hospital acquired infections, for which plazomicin would be used, is included in the DRG or bundled payment and not eligible for any separate payment. For catastrophic cases where costs greatly exceed the bundled payment amount, the hospital may be eligible for an outlier that is intended to cover part of the expense above the standard payment.

Healthcare Reform

A primary trend in the U.S. healthcare industry and elsewhere is cost containment. Government authorities and other third-party payors have attempted to control costs by limiting coverage and the amount of reimbursement for particular medical products, implementing reductions in Medicare and other healthcare funding, and applying new payment methodologies. For example, in March 2010, the ACA was enacted, which, among other things, subjected drug manufacturers to new annual fees based on pharmaceutical companies' share of sales to federal healthcare programs; created a new Patient Centered Outcomes Research Institute to oversee, identify priorities in, and conduct comparative clinical effectiveness research, along with funding for such research; creation of the Independent Payment Advisory Board, which has authority to recommend certain changes to the Medicare program that could result in reduced payments for prescription drugs; and establishment of a Center for Medicare Innovation at the CMS to test innovative payment and service delivery models to lower Medicare and Medicaid spending.

We expect that the new presidential administration and U.S. Congress will seek to modify, repeal, or otherwise invalidate all, or certain provisions of, the ACA. Since taking office, the current administration has continued to support the repeal of all or portions of the ACA. In January 2017, the House and Senate passed a budget resolution that authorizes congressional committees to draft legislation to repeal all or portions of the ACA and permits such legislation to pass with a majority vote in the Senate. There has also been a recently issued executive order stating that the administration's policy is to seek the prompt repeal of the ACA and directed executive departments and for federal agencies to waive, defer, grant exemptions from, or delay the implementation of the provisions of the ACA to the maximum extent permitted by law. There is still uncertainty with respect to the impact the current administration and the U.S. Congress may have, if any, and any changes will likely take time to unfold, and could have an impact on coverage and reimbursement for healthcare items and services covered by plans that were authorized by the ACA. However, we cannot predict the ultimate content, timing or effect of any healthcare reform legislation or the impact of potential legislation on us.

In addition, other legislative changes have been proposed and adopted in the United States since the ACA to reduce healthcare expenditures. The enactment of the Budget Control Act of 2011 on August 2, 2011 led to aggregate reductions of Medicare payments to providers of 2% per fiscal year that, due to subsequent legislative amendments to the statute, will remain in effect through 2025 unless additional action is taken by Congress. On January 2, 2013, the American Taxpayer Relief Act of 2012 was signed into law, which, among other things, further reduced Medicare payments to several types of providers, including hospitals, imaging centers and cancer treatment centers, and increased the statute of limitations period for the government to recover overpayments to providers from three to five years. Recently there has been heightened governmental scrutiny over the manner in which manufacturers set prices for their marketed products, which has resulted in several Congressional inquiries and proposed bills designed to,

among other things, reform government program reimbursement methodologies.

Manufacturing

We do not own or operate manufacturing facilities for the production of any of our product candidates, nor do we have plans to develop our own manufacturing operations in the foreseeable future. We currently employ internal resources to manage our manufacturing and supply chain logistics. We currently rely on a limited number of third-party contract manufacturers for our required raw materials, drug substance, and finished drug product for our preclinical research, clinical trials and potential commercial production. For plazomicin, we source raw materials

from various commercial suppliers, primarily located in Europe and the People's Republic of China, including the aminoglycoside precursor sisomicin. Our drug substance has been manufactured by Hovione and we have entered into an agreement with Hovione for commercial production of plazomicin. The finished drug product is manufactured by a U.S. based contract manufacturer and we have entered into a long-term agreement with this third party. We expect that our in vitro plazomicin assay will be manufactured by Thermo Fisher or another third-party supplier. We have entered into an agreement with Thermo Fisher to commercialize this assay.

Plazomicin is an organic compound of low molecular weight, commonly referred to as a small molecule. Plazomicin is also considered a semi-synthetic molecule since it is derived from a primary starting material that is a natural product, sisomicin, produced by microbial fermentation. Sisomicin is combined with other starting materials over a series of chemical steps to produce plazomicin. We believe that our use of a synthetic process will enable us to have a cost of manufacturing for plazomicin that is similar to other modern small molecule antibiotics.

Research and Development Expenses

We devote a substantial portion of our resources to developing new product candidates. Please see "Management's Discussion and Analysis of Financial Condition and Results of Operations—Financial Overview and Results of Operations-Research and Development Expenses" for the amounts spent on company-sponsored research and development for the past three fiscal years.

Customer Concentration and Geographic Information

For the years ended December 31, 2016, 2015 and 2014, all of our revenue has been generated solely from funding pursuant to U.S. government contracts, and accordingly all contracts receivable relate to funding from U.S. government. See Note 2 to our audited consolidated financial statements included elsewhere in this Annual Report on Form 10-K for additional information.

All of our revenues for the years ended December 31, 2016, 2015, and 2014 were earned in the United States. All of our long-lived assets are located in the United States.

Employees

As of December 31, 2016, we had 106 full-time employees, 79 of whom were primarily engaged in research and development activities and 27 of whom were primarily engaged in business development, finance, legal, human resources, facilities, information technology administration and general management. None of our employees is represented by a labor union and we consider our employee relations to be good.

Additional Information

We view our operations and measure our business as one reportable segment operating primarily in the United States. See Note 2 to our audited consolidated financial statements included elsewhere in this Annual Report on Form 10-K for additional information. Additional information required by this item is incorporated herein by reference to Part II, Item 6, "Selected Financial Data."

We were originally incorporated in Delaware in June 2002 and commenced operations in 2004. We completed our initial public offering of our common stock in March 2014. Our mailing address and executive offices are located at 7000 Shoreline Court, Suite 371, South San Francisco, CA 94080 and our telephone number at that address is (650) 800-3636. We maintain an Internet website at the following address: www.achaogen.com. The information on our website is not incorporated by reference in this annual report on Form 10-K or in any other filings we make with the

SEC.

We make available on or through our website certain reports and amendments to those reports that we file with or furnish to the SEC in accordance with the Exchange Act. These include our annual reports on Form 10-K, our quarterly reports on Form 10-Q, and our current reports on Form 8-K, and amendments to those reports filed or furnished pursuant to Section 13(a) or 15(d) of the Exchange Act. We make this information available on or through our website free of charge as soon as reasonably practicable after we electronically file the information with, or furnish it to, the SEC.

Item 1A. Risk Factors.

Risks Related to Our Business and Capital Requirements

We have a limited operating history, have incurred net losses in each year since our inception and anticipate that we will continue to incur significant losses for the foreseeable future, and if we are unable to achieve and sustain profitability, the market value of our common stock will likely decline.

We are a late-stage biopharmaceutical company with a limited operating history. We have not generated any revenue from the sale of products and have incurred losses in each year since we commenced operations in 2004. All of our product candidates are in development, and none has been approved for sale. In the years ended December 31, 2016, 2015 and 2014, we derived all of our revenue from government contracts for research and development. Our net losses for the years ended December 31, 2016, 2015 and 2014 were $71.2 million, $27.1 million and $20.2 million, respectively. As of December 31, 2016, we had an accumulated deficit of $247.2 million.

We expect to continue incurring significant expenses and increasing operating losses for the foreseeable future as we finalize the analysis and publication of our Phase 3 EPIC (Evaluating Plazomicin In cUTI) trial of our lead product candidate, plazomicin, in the treatment of complicated urinary tract infections ("cUTI"), our Phase 3 CARE (Combating Antibiotic Resistant Enterobacteriaceae) trial of plazomicin in the treatment of infections due to carbapenem-resistant Enterobacteriaceae ("CRE"), seek marketing approval, build commercial supply and conduct pre-marketing activities for plazomicin, and continue the development of our other product candidates. Our expenses will also increase substantially if and as we:

- conduct additional clinical trials for our product candidates;
- continue to discover and develop additional product candidates;
- establish a sales, marketing and distribution infrastructure to commercialize any product candidates for which we may obtain marketing approval;
- establish a manufacturing and supply chain sufficient for commercial quantities of any product candidates for which we may obtain marketing approval;
- maintain, expand and protect our intellectual property portfolio;
- hire additional clinical, scientific and commercial personnel;
- add operational, financial and management information systems and personnel, including personnel to support our product development and planned future commercialization efforts, as well as operating as a public reporting company; and
- acquire or in-license other product candidates and technologies.

If our product candidates fail to demonstrate safety and efficacy in clinical trials, do not gain regulatory approval, or do not achieve market acceptance following regulatory approval and commercialization, we may never become profitable. Even if we achieve profitability in the future, we may not be able to sustain profitability in subsequent periods. Our prior losses, combined with expected future losses, have had and will continue to have an adverse effect on our stockholders' equity and working capital. If we are unable to achieve and sustain profitability, the market value of our common stock will likely decline. Because of the numerous risks and uncertainties associated with developing biopharmaceutical products, we are unable to predict the extent of any future losses or when, if ever, we will become profitable.

We are substantially dependent on the success of our lead product candidate, plazomicin. If we are unable to obtain marketing approval for and successfully commercialize plazomicin, or experience significant delays in doing so, our business could be materially harmed.

We currently have no products approved for sale, and since 2007, we have invested a significant portion of our efforts and financial resources in the development of plazomicin. Our future success is substantially dependent on our ability to successfully develop, obtain regulatory approval for and, ultimately, successfully commercialize

plazomicin. Our ability to develop, obtain regulatory approval for, and successfully commercialize plazomicin effectively will depend on several factors, including the following:

- receipt of marketing approvals from the U.S. Food and Drug Administration ("FDA") and similar regulatory authorities outside the United States;
- receiving the product labeling that enables the successful promotion of plazomicin;
- establishing commercial manufacturing and supply arrangements;
- establishing a commercial infrastructure;
- identifying and successfully establishing one or more collaborations to commercialize plazomicin;
- acceptance of the product by patients, the medical community and third-party payors;
- establishing market share while competing with other therapies;
- successfully executing our pricing and reimbursement strategy;
- a continued acceptable safety and adverse event profile of the product following regulatory approval; and
- qualifying for, identifying, registering, maintaining, enforcing and defending intellectual property rights and claims covering the product.

In addition, our product development and commercialization program includes the development of an in vitro diagnostic ("IVD") assay which must be developed and would need to successfully complete a clinical performance study in order to be approved or cleared for marketing by the FDA and certain other foreign regulatory agencies and then be commercialized concurrently with plazomicin in the associated markets for the appropriate populations. If we are unable to develop, receive marketing approval for plazomicin or an IVD assay in a timely manner or at all, we could experience significant delays to successfully commercialize plazomicin, which would materially and adversely affect our business, financial condition, and results of operations.

We will need substantial additional funding. If we are unable to raise capital when needed, we could be forced to delay, reduce or terminate our product development, other operations or commercialization efforts and impact our status as a going concern.

Developing biopharmaceutical products, including conducting preclinical studies and clinical trials, is an expensive and highly uncertain process that takes years to complete. We expect our expenses to increase substantially as we seek marketing approval for our lead product candidate, plazomicin, and continue the development of our other product candidates. If we obtain marketing approval of plazomicin, we also expect to incur significant sales, marketing, manufacturing and supply expenses.

As of December 31, 2016, we had working capital of $140.6 million and unrestricted cash, cash equivalents and short-term investments of $145.9 million. Management expects that, based on its current operating plans, our existing cash, cash equivalents and short-term investments as of December 31, 2016, combined with the committed funds from the BARDA and NIAID contracts, will enable us to fund our current planned operations for at least the next twelve months. In addition, other factors may arise causing us to need additional capital resources sooner than anticipated. We anticipate that we will need to raise substantial additional financing in the future to fund our operations, including for obtaining marketing approval for plazomicin.

We may obtain additional financing through public or private equity offerings, debt financings, a credit facility, government contracts and/or strategic collaborations. Additional financing may not be available to us when we need it or it may not be available to us on acceptable terms, if at all. Our ability to obtain debt financing may be limited by covenants we have made under our loan and security agreement with Solar Capital Ltd. and our pledge to Solar Capital Ltd. of substantially all of our assets, other than our intellectual property, as collateral. The negative pledge in favor of Solar Capital Ltd. with respect to our intellectual property under the loan and security agreement

could further limit our ability to obtain additional debt financing. Our failure to raise capital as and when needed could have a negative impact on our financial condition and our ability to pursue our business strategies. The amount and timing of our future financing requirements will depend on many factors, including:

- the size, timing and type of the nonclinical and clinical studies that we decide to pursue in the development of our product candidates, including plazomicin;
- the type, number, costs and results of the product candidate development programs which we are pursuing or may choose to pursue in the future;
- the rate of progress and cost of clinical trials we may commence, preclinical studies and other discovery and research and development activities;
- the costs associated with developing a plazomicin IVD assay to support therapeutic drug monitoring;
- the timing of, and costs involved in, seeking and obtaining FDA and other regulatory approvals, including the preparation of a NDA for plazomicin, and any supplemental applications thereto;
- our ability to enter into additional collaboration, licensing or other arrangements and the terms and timing of such arrangements;
- the costs of preparing, filing, prosecuting, maintaining and enforcing any patent claims and other intellectual property rights, including litigation costs and the results of such litigation;
- the emergence of competing technologies and other adverse market developments;
- the resources we devote to marketing, and, if approved, commercializing our product candidates;
- the scope, progress, expansion, and costs of manufacturing our product candidates;
- our ability to enter into additional government contracts, or other collaborative agreements, to support the development of our product candidates and development efforts; and
- the costs associated with being a public company.

Future capital requirements will also depend on the extent to which we acquire or invest in additional complementary businesses, products and technologies. We currently have no understandings, commitments or agreements relating to any of these types of transactions.

If we are unable to raise additional funds when needed, we may be required to delay, reduce, or terminate some or all of our development programs and clinical trials and we may not be able to continue as a going concern. We may also be required to sell or license to others technologies or clinical product candidates or programs that we would prefer to develop and commercialize ourselves.

Clinical drug development involves a lengthy and expensive process with uncertain outcomes that may lead to delayed timelines and increased cost, and may prevent us from being able to complete clinical trials.

Clinical testing is expensive, can take many years to complete, and its outcome and timeline is inherently uncertain. The results of preclinical and clinical studies of our product candidates may not be predictive of the results of later-stage clinical trials. Product candidates in later stages of clinical trials may fail to show the desired safety and efficacy despite having progressed through preclinical studies and initial clinical trials. A number of companies in the pharmaceutical industry have suffered significant setbacks in advanced clinical trials due to lack of efficacy or adverse safety profiles, notwithstanding promising results in earlier studies, and we cannot be certain that we will not face similar setbacks.

We expect to submit an NDA for plazomicin in the second half of 2017, with a planned commercial launch of plazomicin in the U.S. in 2018, if our NDA is approved. We also plan to submit a Marketing Authorization Application to the European Medicines Agency (“EMA”) for plazomicin in 2018.

We plan to submit the results to a peer-reviewed journal and for presentation at medical meetings in 2017. Based on physician market research, we believe the Phase 3 CARE study will provide important and meaningful data regarding the efficacy, safety, microbiology, and dosing, as well as important health economic data, to better inform use of plazomicin in the treatment of patients with CRE infections.

We cannot be certain that our future clinical trials for plazomicin, or other product candidates, will progress as expected, not need to be redesigned, enroll an adequate number of patients on time or be completed on schedule, if at all, or support continued clinical development of the associated product candidate.

Clinical trials can be delayed, aborted or fail for a variety of reasons, including delay or failure:

- to obtain regulatory approval to commence a trial in the countries where the trial is to be conducted;
- to successfully initiate a clinical trial, enroll patients, and complete clinical trial activities in foreign countries;
- to recruit and enroll suitable patients to participate in a trial;
- to reach agreement on acceptable terms with prospective contract research organizations ("CROs"), clinical trial sites, the terms of which can be subject to extensive negotiation and may vary significantly among different CROs and trial sites;
- to obtain institutional review board ("IRB") approval at each site;
- to have patients complete a trial or return for post-treatment follow-up;
- of clinical sites to adhere to trial protocols or continue to participate in a trial;
- to address any patient safety concerns that arise during the course of a trial;
- to address any conflicts with new or existing laws or regulations;
- to add a sufficient number of clinical trial sites;
- to manufacture sufficient quantities of product supply for use in clinical trials; or
- to ensure clinical trial sites comply with Good Clinical Practice ("GCP") guidelines.

Enrollment delays in our clinical trials may result in increased development costs for our product candidates, slow down or halt our product development and approval processes, and jeopardize our ability to commence product sales and generate revenue, which would cause the value of our company to decline and limit our ability to obtain additional financing if needed. Patient enrollment in clinical trials is a function of many factors, including: the nature of clinical trial protocols, existence of competing protocols or treatments (if any), the size and longevity of the target patient population, proximity of patients to clinical sites and eligibility criteria for the clinical trials. Although we will continue to look for opportunities for faster regulatory approval of plazomicin or our other product candidates, we cannot guarantee that additional opportunities will arise, that the FDA or other regulatory authorities will agree with any additional proposals we make or that such additional proposals, even if approved, will be successful.

We could also encounter delays if a clinical trial is suspended or terminated by us upon recommendation of the data monitoring committee for such trial, by the IRBs of the institutions in which such trials are being conducted, or by the FDA or other regulatory authorities. Such authorities may suspend or terminate a clinical trial due to a number of factors, including failure to conduct the clinical trial in accordance with regulatory requirements or our clinical protocols, inspection of the clinical trial operations or trial site by the FDA or other regulatory authorities resulting in the imposition of a clinical hold, unforeseen safety issues or adverse side effects, failure to demonstrate a benefit from using a drug, changes in governmental regulations or administrative actions, or lack of adequate funding to continue the clinical trial.

If we experience delays in the completion of, or termination of, any clinical trial of our product candidates, the commercial prospects of our product candidates may be harmed, and our ability to generate revenue from the sale of

any of these product candidates will be delayed. In addition, any delays in completing our clinical trials will increase our costs, slow down our product candidate development and approval processes, and jeopardize our ability to commence product sales and generate revenue. Any of these occurrences may significantly harm our business, financial condition and prospects.

The revisions to our Phase 3 CARE trial protocol no longer allow it to be powered to demonstrate a superiority outcome and the FDA, the EMA and other regulatory authorities as well as physicians and other third parties may not consider the data from our Phase 3 CARE trial to be supportive of plazomicin's potential to address serious bacterial infections caused by CRE.

Cohort 1 of our Phase 3 CARE trial was originally planned and the size estimated based on a superiority design. We decided to reduce the planned enrollment of our Phase 3 CARE trial. However, with this reduced sample size, the study was not powered to demonstrate superiority. Our ability to claim certain of the market and label benefits that a successful superiority trial would have provided, are reduced because we completed Cohort 1 of the trial with a reduced enrollment size in our Phase 3 CARE trial. Further, because of this, the FDA, the EMA and other regulatory authorities as well as physicians and other third parties may not consider the data from our Phase 3 CARE trial to be supportive of plazomicin's potential to address serious bacterial infections caused by CRE.

Failure to successfully develop, validate and obtain regulatory clearance or approval of a plazomicin IVD assay could harm our development and commercialization strategy for plazomicin for the treatment of serious bacterial infections caused by CRE.

An important element of our development and commercialization strategy for plazomicin for the treatment of serious bacterial infections caused by CRE is the development of an IVD assay to support the Therapeutic Drug Management ("TDM") of patients dosed with plazomicin; the plazomicin IVD assay is intended to measure levels of plazomicin in the blood so patients can receive safe and efficacious doses of plazomicin. In collaboration with ARK Diagnostics, Inc. ("ARK"), we previously co-developed such an assay for use in our Phase 3 CARE study and we are currently co-developing and intend to commercialize an assay capable of use with plazomicin, if approved.

We, and our partner, Microgenics (a part of Thermo Fisher Scientific, Inc.) ("Thermo Fisher") are developing a diagnostic assay for plazomicin and intend to work together to generate the data required for submission of either a 510(k) submission or a Premarket Approval (PMA) application to the FDA. The ability to collect such data and to prepare such a submission can be impacted by a variety of financial, clinical, and regulatory factors that could impact our timing and the ultimate availability of such an assay.

IVD assays can be subject to regulation by the FDA and comparable foreign regulatory authorities as medical devices and therefore require separate regulatory clearance or approval prior to commercialization. The development of a new IVD assay for novel therapeutic such as plazomicin can be complex from an operational and regulatory perspective because of the need for both the drug and the diagnostic to receive regulatory clearance or approval. Should the regulatory clearance or approval process for our IVD assay be delayed, it could impact our ability to successfully commercialize plazomicin for the treatment of certain patients.

It may be necessary to resolve issues such as selectivity/specificity, analytical validation, reproducibility, or clinical validation of a plazomicin assay during the development and regulatory approval process. We also expect to develop an assay for use on additional analyzers beyond the current Roche Modular P. We, or our other current or future collaboration partners may encounter difficulties in developing, obtaining regulatory clearance or approval for, and manufacturing of, an assay with appropriate quality standards, similar to those we face with respect to our drug product candidates themselves. Failure to overcome these hurdles could have an adverse effect on our ability to obtain regulatory clearance or approval for or to obtain market acceptance for and to commercialize an IVD assay or

plazomicin.

If the FDA does not conclude that our product candidate, C-Scape, satisfies the requirements for the 505(b)(2) regulatory approval pathway, or if the requirements for approval under Section 505(b)(2) are not as we expect, the approval pathway for C-Scape will likely take significantly longer, cost significantly more and encounter significantly greater complications and risks than anticipated, and in any case may not be successful.

We intend to seek FDA approval through the 505(b)(2) regulatory pathway for our product candidate, C-Scape, which is a combination of two previously-approved drugs. The Drug Price Competition and Patent Term

Restoration Act of 1984, also known as the Hatch-Waxman Act, added Section 505(b)(2) to the Federal Food, Drug and Cosmetic Act, or FDCA. Section 505(b)(2) permits the filing of an NDA where at least some of the information required for approval comes from studies that were not conducted by or for the applicant and for which the applicant has not obtained a right of reference. If the FDA does not allow us to pursue the 505(b)(2) regulatory pathway for C-Scape as anticipated, we may need to conduct additional clinical trials, provide additional data and information and meet additional standards for regulatory approval. If this were to occur, the time and financial resources required to obtain FDA approval for C-Scape would likely substantially increase. Moreover, the inability to pursue the 505(b)(2) regulatory pathway could result in new competitive products reaching the market faster than C-Scape, which could materially adversely impact our competitive position and prospects. Even if we are allowed to pursue the 505(b)(2) regulatory pathway for C-Scape, we cannot assure you that we will receive the requisite or timely approvals for commercialization of such product candidate. In addition, it is possible competitors will file citizens' petitions with the FDA in an attempt to persuade the FDA that C-Scape, or the clinical studies that support their approval, contain deficiencies. Such actions by our competitors could delay or even prevent the FDA from approving any NDA that we submit under Section 505(b)(2).

If we fail to demonstrate the safety and efficacy of plazomicin or any other product candidate that we develop to the satisfaction of the FDA or comparable foreign regulatory authorities we may incur additional costs or experience delays in completing, or ultimately be unable to complete, the development and commercialization of plazomicin or such other product candidate. This would adversely impact our ability to generate revenue, our business and our results of operations.

We are not permitted to commercialize, market, promote, or sell any product candidate in the United States without obtaining marketing approval from the FDA or in other countries without obtaining approvals from comparable foreign regulatory authorities, such as the EMA, and we may never receive such approvals. To gain approval to market a drug product, we must complete extensive preclinical development and clinical trials that demonstrate the safety and efficacy of the product for the intended indication to the satisfaction of the FDA or other regulatory authority.

We have not previously submitted an NDA to the FDA, or similar drug approval filings to comparable foreign authorities, for any product candidate, and we cannot be certain that plazomicin will be successful in clinical trials or receive regulatory approval. Further, plazomicin may not receive regulatory approval even if it is successful in clinical trials. If we do not receive regulatory approval for plazomicin, we may not be able to continue our operations. Even if we successfully obtain regulatory approval to market plazomicin, our revenue from this approval will be dependent, in part, upon our or a commercial partner's ability to obtain regulatory approval of an IVD assay to be used with plazomicin for the treatment of serious bacterial infections caused by CRE, as well as upon the size of the markets in the territories for which we gain regulatory approval and have commercial rights.

The FDA or any foreign regulatory agencies can delay, limit, or deny approval of plazomicin for many reasons, including:

- our inability to demonstrate to the satisfaction of the FDA or the applicable foreign regulatory agency that plazomicin is safe and effective for the requested indication;
- the FDA's or the applicable foreign regulatory agency's disagreement with the interpretation of data from preclinical studies or clinical trials;
- our inability to demonstrate that the clinical and other benefits of plazomicin outweigh any safety or other perceived risks;
- the FDA's or the applicable foreign regulatory agency's requirement for additional preclinical or clinical studies;
- the FDA's or the applicable foreign regulatory agency's non-approval of the formulation, labeling or the specifications of plazomicin;

- the FDA's or the applicable foreign regulatory agency's failure to approve the manufacturing processes or facilities of third-party manufacturers with which we contract;

- the potential for approval policies or regulations of the FDA or the applicable foreign regulatory agencies to significantly change in a manner rendering our clinical data insufficient for approval; or
- failure to adequately demonstrate study conduct oversight, ensure data integrity, and that clinical study sites complied with the principles of Good Clinical Practice, such that we do not pass pre-approval inspections by the FDA or other foreign regulatory agencies.

Even if we eventually complete clinical testing and receive approval of an NDA or foreign regulatory filing for plazomicin, the FDA or the applicable foreign regulatory agency may grant approval contingent on the performance of costly additional clinical trials which may be required after approval. The FDA or the applicable foreign regulatory agency also may approve plazomicin for a more limited indication or a narrower patient population than we originally requested, and the FDA, or applicable foreign regulatory agency, may not approve the labeling that we believe is necessary or desirable for the successful commercialization of plazomicin. For example, we anticipate the NDA for plazomicin will initially be based on our Phase 3 EPIC trial and that, if approved, we anticipate the U.S. label will indicate that plazomicin is for use in patients with infections that have limited or no alternative antibiotic treatment options. In addition, we believe that the label will include in vitro data against antibiotic resistant pathogens in the microbiology section of the drug label. However, the FDA may approve a label that omits this in vitro data or that limits plazomicin to a more limited indication or narrower patient population, which may harm our ability to successfully commercialize plazomicin, if approved. Any delay in obtaining, or inability to obtain, applicable regulatory approval would delay or prevent commercialization of plazomicin and would materially adversely impact our business and prospects. Any other product candidate we advanced to the marketing approval stage would also be subject to the risks delineated above.

Serious adverse events or other unexpected properties of plazomicin or any other product candidate may be identified during development or after approval that could delay, prevent or cause the withdrawal of regulatory approval, limit the commercial potential, or result in significant negative consequences following marketing approval.

Serious adverse events or undesirable side effects caused by, or other unexpected properties of, our product candidates could result in a more restrictive label, the imposition of distribution or use restrictions or the delay or denial of regulatory approval by the FDA or comparable foreign regulatory authorities. If plazomicin or any of our other product candidates are associated with serious adverse events or undesirable side effects or have properties that are unexpected, we may need to abandon their development or limit development to certain uses or subpopulations in which the undesirable side effects or other characteristics are less prevalent, less severe or more acceptable from a risk-benefit perspective. Many compounds that initially showed promise in clinical or earlier stage testing have later been found to cause undesirable or unexpected side effects that prevented further development of the compound.

To date, plazomicin has generally been well tolerated in clinical trials conducted in healthy subjects, subjects with renal impairment, and in patients with cUTI, and in patients with serious infections due to CRE and there have been no reports of serious adverse events related to plazomicin in our completed clinical trials. Toxicity in the kidneys and inner ear are the most significant identified risks for plazomicin, which are well-known risks for the aminoglycoside class of antibiotics. Hypotension is also a potential risk for plazomicin.

Undesirable side effects or other unexpected adverse events or properties of plazomicin or any of our other product candidates could arise or become known either during clinical development or, if approved, after the approved product has been marketed. If such an event occurs during development, our trials could be suspended or terminated and the FDA or comparable foreign regulatory authorities could order us to cease further development of, or deny approval of, plazomicin or our other product candidates. If such an event occurs after plazomicin or such other product candidates are approved, a number of potentially significant negative consequences may result, including:

- regulatory authorities may withdraw the approval of such product;
- regulatory authorities may require additional warnings on the label or impose distribution or use restrictions;

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- regulatory authorities may require one or more post-market studies;
- we may be required to create a medication guide outlining the risks of such side effects for distribution to patients;
- we could be sued and held liable for harm caused to patients; and
- our reputation may suffer.

Any of these events could prevent us from achieving or maintaining market acceptance of the affected product candidate, if approved, or could substantially increase commercialization costs and expenses, which could delay or prevent us from generating revenue from the sale of our products and harm our business and results of operations.

We cannot predict to what extent bacteria may develop resistance to plazomicin or how resistance could spread, which could affect the revenue potential for plazomicin.

We are developing plazomicin to treat multi-drug resistant ("MDR") infections. The bacteria responsible for these infections evolve quickly and readily transfer their resistance mechanisms within and between species. Furthermore, some resistance to plazomicin already exists and we cannot predict how the prevalence of bacterial resistance to plazomicin will change over time.

As with some other commercially available aminoglycosides, plazomicin is not active against organisms expressing a resistance mechanism known as ribosomal methyltransferase. Although occurrence of this resistance mechanism among CRE varies regionally and is currently rare in the United States, there have been isolated cases of infections by bacteria carrying ribosomal methyltransferase in the United States. We cannot predict whether ribosomal methyltransferase will become widespread in regions where we intend to market plazomicin if it is approved. The growth of MDR infections in community settings or in countries with poor public health infrastructures, or the potential use of plazomicin outside of controlled hospital settings, could contribute to the rise of plazomicin resistance. If resistance to plazomicin becomes prevalent, our ability to generate revenue from plazomicin could suffer.

We may become dependent on our partner Thermo Fisher to commercialize an IVD assay.

We have entered into a collaboration with Thermo Fisher for the development and commercialization of a plazomicin IVD assay, we may be dependent on Thermo Fisher with respect to such manufacturing and supply and with respect to commercialization in the United States and the EU. This reduces our control over these activities but would not relieve us of our responsibility to ensure compliance with all required legal, regulatory and scientific standards with respect to plazomicin.

We or Thermo Fisher may encounter difficulties in developing an assay for commercial application in one or more countries, including issues in relation to automation, selectivity/specificity, analytical validation, reproducibility, or clinical validation of such assay. If Thermo Fisher does not perform its contractual duties or obligations, experiences work stoppages, does not meet expected deadlines, terminates its agreements with us or needs to be replaced, or if they otherwise do not meet our expectations for development, manufacture or commercialization of the assay, we may need to enter into new arrangements with one or more alternative third parties for development, manufacture or commercialization of the assay or an alternative assay. We may not be able to do so on commercially reasonably terms, or within the terms of the commercialization agreement without amending such terms, or at all, which could adversely impact our business and results of operations related to plazomicin for the treatment of serious bacterial infections caused by CRE.

If we are not successful in discovering, developing and commercializing additional product candidates, our ability to expand our business and achieve our strategic objectives would be impaired.

Although a substantial amount of our efforts is focused, and will continue to be focused, on the potential approval of our lead product candidate, plazomicin, a key element of our strategy is to discover, develop and commercialize a portfolio of therapeutics to treat MDR bacterial infections. We are seeking to do so through our internal research programs and are exploring, and intend to explore in the future, strategic partnerships for the

development of new products. Other than plazomicin, all of our other potential product candidates remain in the discovery and preclinical stages.

Research programs to identify product candidates require substantial technical, financial and human resources, whether or not any product candidates are ultimately identified. Our research programs may initially show promise in identifying potential product candidates, yet fail to yield product candidates for clinical development for many reasons, including the following:

- the research methodology used may not be successful in identifying potential product candidates;
- we may be unable to successfully modify candidate compounds to be active in gram-negative bacteria or defeat bacterial resistance mechanisms or identify viable product candidates in our screening campaigns;
- competitors may develop alternatives that render our product candidates obsolete;
- product candidates we develop may nevertheless be covered by third party patents or other exclusive rights;
- a product candidate may, on further study, be shown to have harmful side effects or other characteristics that indicate it is unlikely to be effective or otherwise does not meet applicable regulatory criteria;
- a product candidate may not be capable of being produced in commercial quantities at an acceptable cost, or at all;
- a product candidate may not be accepted as safe and effective by patients, the medical community or third-party payors; and
- the development of bacterial resistance to potential product candidates may render them ineffective against target infections.

We cannot guarantee that these efforts will be successful. If we identify viable product candidates, we would have to submit a new IND application for any compound we seek to advance to clinical trials.

If we are unsuccessful in identifying and developing additional product candidates, our potential for growth may be impaired.

Even if a product candidate does obtain regulatory approval it may never achieve market acceptance by physicians, patients, hospitals, third-party payors and others in the medical community necessary for commercial success and the market opportunity may be smaller than we estimate.

Even if we obtain FDA or other regulatory approvals, and are able to launch plazomicin or any other product candidate commercially, the product candidate may not achieve market acceptance among physicians, patients, hospitals (including pharmacy directors) and third-party payors and, ultimately, may not be commercially successful. Market acceptance and market opportunity of any product candidate for which we receive approval depends on a number of factors, including:

- the efficacy and safety of the product candidate as demonstrated in clinical trials;
- relative convenience and ease of administration;
- the clinical indications for which the product candidate is approved;
- the potential and perceived advantages and disadvantages of the product candidates, including cost and clinical benefit relative to alternative treatments;
- the willingness of physicians to prescribe the product;
- the willingness of hospital pharmacy directors to purchase our products for their formularies;

- acceptance by physicians, operators of hospitals and treatment facilities and parties responsible for reimbursement of the product;
- the availability of adequate coverage and reimbursement by third-party payors and government authorities;
- the effectiveness of our sales and marketing efforts;
- the strength of our marketing and distribution support;
- limitations or warnings, including distribution or use restrictions, contained in the product's approved labeling or an approved risk evaluation and mitigation strategy;
- whether the product is designated under physician treatment guidelines as a first-line therapy or as a second- or third-line therapy for particular infections;
- the approval of other new products for the same indications;
- the timing of market introduction of the approved product as well as competitive products;
- adverse publicity about the product or favorable publicity about competitive products;
- the emergence of bacterial resistance to the product candidate; and
- the rate at which resistance to other drugs in the target infections grow.

Any failure by plazomicin or any other product candidate that obtains regulatory approval to achieve market acceptance or commercial success would adversely affect our business prospects.

The availability of adequate third-party coverage and reimbursement for newly approved products is uncertain, and failure to obtain adequate coverage and reimbursement from government and other third-party payors could impede our ability to market any future products we may develop and could limit our ability to generate revenue.

There is significant uncertainty related to the third-party payor coverage and reimbursement of newly approved medical products. The commercial success of our future products in both domestic and international markets depends on whether third-party coverage and reimbursement is available for our future products. Governmental payors, including Medicare and Medicaid, health maintenance organizations and other third-party payors are increasingly attempting to manage their healthcare expenditures by limiting both coverage and the level of reimbursement of new drugs and biologics and, as a result, they may not cover or provide adequate reimbursement for our future products. These payors may not view our future products as cost-effective, and coverage and reimbursement may not be available to our customers or may not be sufficient to allow our future products to be marketed on a competitive basis.

Third-party payors are exerting increasing influence on decisions regarding the use of, and coverage and reimbursement levels for, particular treatments. Such third-party payors, including Medicare, are challenging the prices charged for medical products and services, and many third-party payors limit or delay coverage and reimbursement for newly approved healthcare products. In particular, third-party payors may limit the covered indications. Cost-control initiatives could cause us to decrease the price we might establish for products, which could result in lower than anticipated revenue from the sale of our product candidates. If we decrease the prices for our product candidates because of competitive pressures or if governmental and other third-party payors do not provide adequate coverage or reimbursement, our prospects for revenue and profitability will suffer.

In addition, to the extent that our product candidates will be used in a hospital inpatient setting, hospitals often receive fixed reimbursement for all of a patient's care, including the cost of our drug products and IVD assay, based on the patient's diagnosis. For example, Medicare reimbursement for hospital inpatient stays is generally made under a prospective payment system that is determined by a classification system known as the Medicare severity diagnosis-related groups. Our patients' access to adequate coverage and reimbursement by government and private insurance plans is central to the acceptance of our future products. We may be unable to sell our products on a

profitable basis if third-party payors reduce their current levels of payment, or if our costs of production increase faster than increases in reimbursement levels.

We are developing our lead product candidate plazomicin for the treatment of serious bacterial infections due to MDR Enterobacteriaceae, including CRE, which constitute a growing but relatively small patient population. Antibiotics have historically been marketed towards broad patient populations at relatively low prices. Based on the high unmet medical need in the treatment of these infections and the high costs of treating antibiotic resistant infections, we are targeting value-based pricing for plazomicin. If hospitals or governmental or other third-party payors do not view the benefits of plazomicin as worth the cost, we will be unable to achieve our pricing and reimbursement objectives and our prospects for revenue and profitability will suffer.

We rely on third parties to conduct some of our preclinical studies and all of our clinical trials. If these third parties do not successfully carry out their contractual duties or meet expected deadlines, we may be unable to obtain regulatory approval for or commercialize any of our product candidates.

We rely on medical institutions, clinical investigators, contract laboratories and other third parties, such as CROs, to conduct our preclinical studies and clinical trials on our product candidates in compliance with applicable regulatory requirements. These third parties are not our employees and, except for restrictions imposed by our contracts with such third parties, we have limited ability to control the amount or timing of resources that they devote to our programs. Although we rely on these third parties to conduct our preclinical studies and clinical trials, we remain responsible for ensuring that each of our preclinical studies and clinical trials is conducted in accordance with its investigational plan and protocol and the applicable legal, regulatory, and scientific standards, and our reliance on these third parties does not relieve us of our regulatory responsibilities. The FDA and regulatory authorities in other jurisdictions require us to comply with regulations and standards, commonly referred to as current good clinical practices (“cGCPs”), for conducting, monitoring, recording and reporting the results of clinical trials, in order to ensure that the data and results are scientifically credible and accurate and that the trial subjects are adequately informed of the potential risks of participating in clinical trials. If we or any of our third party contractors fail to comply with applicable cGCPs, the clinical data generated in our clinical trials may be deemed unreliable and the FDA or comparable foreign regulatory authorities may require us to perform additional clinical trials before approving our marketing applications. In addition, we are required to report certain financial interests of our third party investigators if these relationships exceed certain financial thresholds and meet other criteria. The FDA or comparable foreign regulatory authorities may question the integrity of the data from those clinical trials conducted by principal investigators who previously served or currently serve as scientific advisors or consultants to us from time to time and receive cash compensation in connection with such services. Our clinical trials must also generally be conducted with products produced under current good manufacturing practice (“cGMP”) regulations. Our failure to comply with these regulations may require us to repeat clinical trials, which would delay the regulatory approval process.

Many of the third parties with whom we contract may also have relationships with other commercial entities, some of which may compete with us. If the third parties conducting our preclinical studies or our clinical trials do not perform their contractual duties or obligations or comply with regulatory requirements we may need to enter into new arrangements with alternative third parties. This could be costly, and our preclinical studies or clinical trials may need to be extended, delayed, terminated or repeated, and we may not be able to obtain regulatory approval in a timely fashion, or at all, for the applicable product candidate, or to commercialize such product candidate being tested in such studies or trials. If any of our relationships with these third parties terminate, we may not be able to enter into arrangements with alternative third party contractors or to do so on commercially reasonable terms. Though we carefully manage our relationships with our CROs, there can be no assurance that we will not encounter similar challenges or delays in the future or that these delays or challenges will not have a material adverse impact on our business, financial condition and prospects.

We rely on third-party contract manufacturing organizations to manufacture and supply plazomicin and other product candidates for us, as well as certain raw materials used in the production thereof. If one of our suppliers or manufacturers fails to perform adequately we may be required to incur significant delays and costs to find new suppliers or manufacturers.

We currently have limited experience in, and we do not own facilities for, manufacturing our product candidates, including plazomicin. We rely upon third-party manufacturing organizations to manufacture and supply

our product candidates and certain raw materials used in the production thereof. Some of our key components for the production of plazomicin have a limited number of suppliers. In particular, sisomicin, the aminoglycoside precursor for plazomicin, is supplied by a single manufacturer in China for which we do not have a commercial supply agreement.

The facilities used by our contract manufacturers to manufacture our product candidates must be approved by the FDA pursuant to inspections that will be conducted after we submit our NDA to the FDA. We do not control the manufacturing process of, and are completely dependent on, our contract manufacturing partners for compliance with cGMP regulations for manufacture of our drug products. If our contract manufacturers cannot successfully manufacture material that conforms to our specifications and the strict regulatory requirements of the FDA or others, they will not be able to secure and/or maintain regulatory approval for their manufacturing facilities. In addition, we have no control over the ability of our contract manufacturers to maintain adequate quality control, quality assurance and qualified personnel. If the FDA or a comparable foreign regulatory authority does not approve these facilities for the manufacture of our product candidates or if it withdraws any such approval in the future, we may need to find alternative manufacturing facilities, which would significantly impact our ability to develop, obtain regulatory approval for or market our product candidates, if approved.

Our third party suppliers may not be able to meet our supply needs or timelines and this may negatively affect our business. A majority of the manufacturing process is operated internationally, and therefore may be subject to similar risks of the sort described by the risk factor entitled “A variety of risks associated with international operations could materially adversely affect our business.”

The failure of third-party manufacturers or suppliers to perform adequately or the termination of our arrangements with any of them may adversely affect our business.

A variety of risks associated with international operations could materially adversely affect our business.

Certain of our existing suppliers are located outside of the United States, including our sole source supplier for sisomicin, a key raw material for the production of plazomicin, which is located in China, and for which we do not have a commercial supply agreement. Additionally, if plazomicin is approved for commercialization outside the United States, we will likely seek to enter into agreements with third parties to market plazomicin outside the United States. We are, or we expect that we will be, subject to additional risks related to these international business relationships, including:

- different regulatory requirements for drug approvals in foreign countries;
- differing U.S. and foreign drug import and export rules;
- reduced protection for intellectual property rights in certain foreign countries;
- unexpected changes in tariffs, trade barriers and regulatory requirements;
- different reimbursement systems;
- 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 currency fluctuations, which could result in increased operating expenses and reduced revenue, and other obligations incident to doing business in another country;
- potential liability resulting from development work conducted by these third parties; and
- business interruptions resulting from geopolitical events, including war and terrorism, or natural disasters.

We may be subject to costly product liability claims related to our clinical trials and product candidates and, if we are unable to obtain adequate insurance or are required to pay for liabilities resulting from a claim excluded from, or beyond the limits of our insurance coverage, a material liability claim could adversely affect our financial condition.

Because we conduct clinical trials with human patients, we face the risk that the use of our product candidates may result in adverse side effects to patients in our clinical trials. We face even greater risks upon any commercialization of our product candidates. Although we have product liability insurance, which covers our clinical trials for up to $5 million, our insurance may be insufficient to reimburse us for any expenses or losses we may suffer, and we will be required to increase our product liability insurance coverage for our advanced clinical trials that we plan to initiate. We do not know whether we will be able to continue to obtain product liability coverage and obtain expanded coverage if we require it, on acceptable terms, if at all. We may not have sufficient resources to pay for any liabilities resulting from a claim excluded from, or beyond the limits of, our insurance coverage. Where we have provided indemnities in favor of third parties under our agreements with them, there is also a risk that these third parties could incur liability and bring a claim under such indemnities. An individual may bring a product liability claim against us alleging that one of our product candidates or products causes, or is claimed to have caused, an injury or is found to be unsuitable for consumer use. Any product liability claim brought against us, with or without merit, could result in:

- withdrawal of clinical trial volunteers, investigators, patients or trial sites;
- the inability to commercialize our product candidates;
- decreased demand for our product candidates;
- regulatory investigations that could require costly recalls or product modifications;
- loss of revenue;
- substantial costs of litigation;
- liabilities that substantially exceed our product liability insurance, which we would then be required to pay ourselves;
- an increase in our product liability insurance rates or the inability to maintain insurance coverage in the future on acceptable terms, if at all;
- the diversion of management’s attention from our business; and
- damage to our reputation and the reputation of our products.

Product liability claims may subject us to the foregoing and other risks, which could have a material adverse effect on our business, results of operations, financial condition and prospects.

If we fail to establish an effective distribution process, which includes utilizing cold-chain logistics for plazomicin and the associated IVD assay, our business may be adversely affected.

We do not currently have the infrastructure necessary for distributing pharmaceutical products to patients. We intend to contract with a third-party logistics company to warehouse these products and distribute them, and we will require plazomicin and the associated IVD assay to be maintained at a controlled temperature for some of the distribution chain. Failure to secure contracts with a logistics company could negatively impact the distribution of plazomicin or the IVD assay. If we are unable to effectively establish and manage the distribution process, the commercial launch and sales of plazomicin and the associated IVD assay will be delayed or severely compromised and our results of operations may be harmed.

In addition, the use of third party distributors, including with respect to cold-chain logistics for plazomicin and the associated IVD assay, involves certain risks, including, but not limited to, risks that distributors or pharmacies will:

- not provide us with accurate or timely information regarding their inventories, the number of patients who are using plazomicin or the IVD assay, or complaints regarding them;
- not effectively sell or support plazomicin or the associated IVD assay with sufficient cold storage;
- reduce their efforts or discontinue to sell or support plazomicin or the IVD assay;
- not devote the resources necessary to sell plazomicin or the IVD assay in the volumes and within the time frames that we expect;
- be unable to satisfy financial obligations to us or others; or
- cease operations.

Plazomicin is still undergoing evaluation for, and we expect our IVD assay will have, a room temperature shelf life. Currently cold-chain logistics is required and if we do not effectively maintain our cold-chain supply logistics, then we may experience an unusual number of product returns or out of date product. Any such failure may result in decreased product sales and lower product revenue, which would harm our business.

We currently have limited sales and marketing and distribution staff. If we are unable to develop an adequate sales and marketing and distribution capability on our own or through third parties, we will not be successful in commercializing our future products.

We currently have limited sales, marketing and distribution staff and no history in this capacity. To achieve commercial success for any approved product candidate, we must either develop an adequate sales, marketing and distribution organization or outsource these functions to third parties. If we rely on third parties for selling, marketing and distributing our approved products, any revenue we receive will depend upon the efforts of third parties, which may not be successful and are only partially within our control, and our product revenue may be lower than if we directly sold or marketed our products. If we are unable to enter into arrangements with third parties to sell, market and distribute product candidates for which we have received regulatory approval on acceptable terms or at all, we will need to market these products ourselves. This is likely to be expensive and logistically difficult, as it would require us to build our own sales, marketing and distribution capacity. We have no historical operations in this area, and if such efforts were necessary, we may not be able to successfully commercialize our future products. If we are not successful in commercializing our future products, either on our own or through third parties, any future product revenue will be materially and adversely affected, which would harm our business.

We face substantial competition and our competitors may discover, develop or commercialize products faster or more successfully than us.

The development and commercialization of new drug products is highly competitive. We face competition from major pharmaceutical companies, specialty pharmaceutical companies and biotechnology companies worldwide with respect to plazomicin and other product candidates that we may seek to develop or commercialize in the future. There are a number of pharmaceutical and biotechnology companies that currently market and sell products or are pursuing the development of product candidates for the treatment of MDR infections. Potential competitors also include academic institutions, government agencies and other public and private research organizations. Our competitors may succeed in developing, acquiring or licensing technologies and drug products that are more effective, safer or less costly than plazomicin or any other product candidates that we are currently developing or that we may develop, which could render our product candidates obsolete and noncompetitive.

There are a variety of available therapies marketed for the treatment of MDR infections that we would expect would compete with plazomicin, including Avycaz™ (ceftazadime/avibactam), which is marketed by Allergan plc in the United States and marketed by Pfizer outside the United States, tigecycline, which is marketed by Pfizer as Tygacil®,

other aminoglycosides that are generically available (such as gentamicin, amikacin, tobramycin), and

polymixins that are generically available (colistin and polymixin B). Many of the available therapies are well-established and widely accepted by physicians, patients and third-party payors. Insurers and other third-party payors may also encourage the use of generic products. If plazomicin is approved, it may be priced at a premium over other competitive products. This may limit plazomicin's adoption for MDR gram-negative infections.

There are also a number of products in late-stage clinical development by third parties to treat MDR gram-negative infections. Tetraphase Pharmaceuticals, Inc. is developing eravacycline for complicated urinary and intra-abdominal infections, as well as pneumonia. The Medicines Company is developing Carbavance™ for cUTI and various infection types due to CRE. Merck & Co., Inc. is developing imipenem/relebactam for certain life-threatening infections caused by MDR strains, including infections due to metallo- â-lactamase producing gram-negative pathogens. Zavante Therapeutics, Inc. is developing ZTI-01 for cUTI. Shionogi is developing cefiderocol for carbapenem-resistant gram-negative pathogens. We may also eventually face competition from products in earlier development stage. If our competitors obtain marketing approval from the FDA or comparable foreign regulatory authorities for their product candidates more rapidly than us, it could result in our competitors establishing a strong market position before we are able to enter the market.

In July 2012, the Food and Drug Administration Safety and Innovation Act was passed, which included the Generating Antibiotics Incentives Now Act (the "GAIN Act"). The GAIN Act provides incentives for the development of new, qualified infectious disease products, including adding five years to the otherwise applicable regulatory exclusivity period. We requested and the FDA granted qualified infectious disease product designation for plazomicin for the treatment of hospital acquired bacterial pneumonia, ventilator-associated pneumonia, complicated intra-abdominal infections, cUTIs, and catheter-related bloodstream infections on December 14, 2014. The incentives provided under the GAIN Act, along with government contract funding and other incentives for antibiotic research, may result in more competition in the market for new antibiotics.

Many of our competitors have materially greater name recognition and financial, manufacturing, marketing, research and drug development resources than we do. Additional mergers and acquisitions in the biotechnology and pharmaceutical industries may result in even more resources being concentrated in our competitors. Large pharmaceutical companies in particular have extensive expertise in preclinical and clinical testing and in obtaining regulatory approvals for drugs. In addition, academic institutions, government agencies, and other public and private organizations conducting research may seek patent protection with respect to potentially competitive products or technologies. These organizations may also establish exclusive collaborative or licensing relationships with our competitors.

Finally, the success of any product that is successfully commercialized will depend in large part on our ability to prevent competitors from launching a generic version that would compete with such product. If such competitors are able to establish that our patents are invalid or not infringed by the generic version of our product, they may be able to launch a generic product prior to the expected expiration of our relevant patents, and any generic competition could have a material adverse effect on our business, results of operations, financial condition and prospects.

We may attempt to form collaborations in the future with respect to our technology and product candidates, but we may not be able to do so, which may cause us to alter our development and commercialization plans.

We may form strategic alliances, create joint ventures or collaborations or enter into licensing arrangements with third parties with respect to our programs that we believe will complement or augment our existing business. For example, we currently intend to identify one or more strategic partners for the commercialization of plazomicin, and we may also attempt to find one or more strategic partners for the development or commercialization of one or more of our other product candidates. We face significant competition in seeking appropriate strategic partners, and the negotiation process to secure appropriate terms is time-consuming and complex. We may not be successful in our

efforts to establish strategic partnerships for our product candidates and programs on terms that are acceptable to us, or at all.

Any delays in identifying suitable collaborators and entering into agreements to develop or commercialize our product candidates could negatively impact the development or commercialization of our product candidates in geographic regions where we do not have development and commercialization infrastructure. Absent a collaboration partner, we would need to undertake development or commercialization activities at our own expense. If we elect to fund and undertake development or commercialization activities on our own, we may need to obtain additional

expertise and additional capital, which may not be available to us on acceptable terms or at all. If we are unable to do so, we may not be able to develop our product candidates or bring them to market and our business may be materially and adversely affected.

We may be unable to realize the potential benefits of any collaboration.

Even if we are successful in entering into a collaboration with respect to the development or commercialization of one or more product candidates, there is no guarantee that the collaboration will be successful. Collaborations may pose a number of risks, including:

- collaborators often have significant discretion in determining the efforts and resources that they will apply to the collaboration, and may not commit sufficient resources to the development, marketing or commercialization of the product or products that are subject to the collaboration;
- collaborators may not perform their obligations as expected;
- collaborators may cease to devote resources to the development or commercialization of our product candidates if the collaborators view our product candidates as competitive with their own products or product candidates;
- disagreements with collaborators, including disagreements over proprietary rights, contract interpretation or the course of development, might cause delays or termination of the development or commercialization of product candidates, and might result in legal proceedings, which would be time-consuming, distracting and expensive;
- collaborators may be impacted by changes in their strategic focus or available funding, or business combinations involving them, which could cause them to divert resources away from the collaboration;
- collaborators may infringe the intellectual property rights of third parties, which may expose us to litigation and potential liability;
- the collaborations may not result in us achieving revenue to justify such transactions; and
- collaborations may be terminated and, if terminated, may result in a need for us to raise additional capital to pursue further development or commercialization of the applicable product candidate.

As a result, a collaboration may not result in the successful development or commercialization of our product candidates.

Our operating activities may be restricted as a result of covenants related to the indebtedness under our loan agreement and we may be required to repay the outstanding indebtedness in an event of default, which could have a materially adverse effect on our business.

On August 5, 2015, we entered into a loan and security agreement with Solar Capital Ltd., pursuant to which Solar Capital Ltd. agreed to make available to us term loans with an aggregate principal amount of up to $25 million, $15 million of which was provided to us on August 5, 2015 and $10 million of which was provided to us on June 20, 2016. Until we have repaid such indebtedness, the loan and security agreement subjects us to various customary covenants, including requirements as to financial reporting and insurance, and restrictions on our ability to dispose of our business or property, to change our line of business, to liquidate or dissolve, to enter into any change in control transaction, to merge or consolidate with any other entity or to acquire all or substantially all the capital stock or property of another entity, to incur additional indebtedness, to incur liens on our property, to pay any dividends or other distributions on capital stock other than dividends payable solely in capital stock, to redeem capital stock, to enter into licensing agreements, to engage in transactions with affiliates, or to encumber our intellectual property. Our business may be adversely affected by these restrictions on our ability to operate our business.

Additionally, we may be required to repay the outstanding indebtedness under the loan facility if an event of default occurs under the loan and security agreement. Under the loan and security agreement, an event of default

will occur if, among other things, we fail to make payments under the loan and security agreement; we breach any of our covenants under the loan and security agreement, subject to specified cure periods with respect to certain breaches; the Lender determines that a material adverse change has occurred; we or our assets become subject to certain legal proceedings, such as bankruptcy proceedings; we are unable to pay our debts as they become due; or we default on contracts with third parties which would permit the holder of indebtedness to accelerate the maturity of such indebtedness or that could have a material adverse change on us. We may not have enough available cash or be able to raise additional funds through equity or debt financings to repay such indebtedness at the time any such event of default occurs. In this case, we may be required to delay, limit, reduce or terminate our product development or commercialization efforts or grant to others rights to develop and market product candidates that we would otherwise prefer to develop and market ourselves. Solar Capital Ltd. could also exercise its rights as collateral agent to take possession of and to dispose of the collateral securing the term loans, which collateral includes substantially all of our property (excluding intellectual property, which is subject to a negative pledge). Our business, financial condition and results of operations could be materially adversely affected as a result of any of these events.

We may need to grow our organization, and we may experience difficulties in managing growth.

As of December 31, 2016, we had 106 employees. We will need to expand our managerial, operational, financial and other resources in order to manage our operations and clinical trials, continue our development activities and commercialize plazomicin or other product candidates. Our management and personnel, systems and facilities currently in place may not be adequate to support this future growth. Our need to effectively execute our business strategy requires that we:

- manage all our planned clinical trials;
- manage our internal discovery and development efforts effectively while carrying out our contractual obligations to licensors, contractors, government agencies, any future collaborators and other third parties;
- conduct pre-commercial activities for plazomicin;
- continue to improve our operational, financial and management controls, reporting systems and procedures; and
- identify, recruit, maintain, motivate and integrate additional employees.

If we are unable to expand our managerial, operational, financial and other resources to the extent required to manage our development and commercialization activities, our business will be materially adversely affected.

We are highly dependent on the services of our executive team and our ability to attract and retain qualified personnel.

We may not be able to attract or retain qualified management and scientific and clinical personnel in the future due to the intense competition for qualified personnel among biotechnology, pharmaceutical and other businesses, particularly in the San Francisco Bay Area. We are highly dependent on the principal members of our management and scientific staff, particularly our executive team. If we are not able to retain our executive team or are not able to attract, on acceptable terms, additional qualified personnel necessary for the continued development of our business, we may not be able to sustain our operations or grow. Although we have executed employment agreements with each member of our current executive management team, we may not be able to retain their services as expected. In addition to the competition for personnel, the San Francisco Bay Area in particular is characterized by a high cost of living. Although we historically have not had any material difficulty attracting qualified experienced personnel to our company, we could in the future have such difficulties and may be required to expend significant financial resources in our employee recruitment and retention efforts.

In addition, we have scientific and clinical advisors who assist us in formulating our product development and clinical strategies. These advisors are not our employees and may have commitments to, or consulting or advisory contracts with, other entities that may limit their availability to us, or may have arrangements with other companies to assist in

the development of products that may compete with ours.

If we are not able to attract, retain and motivate necessary personnel to accomplish our business objectives, we may experience constraints that will significantly impede the achievement of our development objectives, our ability to raise additional capital and our ability to implement our business strategy.

Recent changes in our executive leadership and any similar changes in the future may serve as a significant distraction for our management and employees.

Since the beginning of 2016, there have been a number of changes to our executive leadership team. In November 2016, we hired our General Counsel, Gary Loeb, and in July 2016, we hired our Chief Financial Officer, Tobin Schilke. Such changes, or any other future changes in our executive leadership, may disrupt our operations as we adjust to the reallocation of responsibilities and assimilate new leadership and, potentially, differing perspectives on our strategic direction. If the transition in executive leadership is not smooth, the resulting disruption could negatively affect our operations and impede our ability to execute our strategic plan.

Our business involves the use of hazardous materials and we and our third-party manufacturers must comply with environmental laws and regulations, which may be expensive and restrict how we do business.

Our third-party manufacturers' activities and our own activities involve the controlled storage, use and disposal of hazardous materials, including the components of our pharmaceutical product candidates, test samples and reagents, biological materials and other hazardous compounds. We and our manufacturers are subject to federal, state, local and foreign laws and regulations governing the use, generation, manufacture, storage, handling and disposal of these hazardous materials. We currently carry no insurance specifically covering environmental claims relating to the use of hazardous materials. Although we believe that our safety procedures for handling and disposing of these materials and waste products comply with the standards prescribed by these laws and regulations, we cannot eliminate the risk of accidental injury or contamination from the use, storage, handling or disposal of hazardous materials. In the event of an accident, state or federal or other applicable authorities may curtail our use of these materials and/or interrupt our business operations. In addition, if an accident or environmental discharge occurs, or if we discover contamination caused by prior operations, including by prior owners and operators of properties we acquire, we could be liable for cleanup obligations, damages and fines. If such unexpected costs are substantial, this could significantly harm our financial condition and results of operations.

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 product 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 or disruption from computer viruses, software bugs, unauthorized access, natural disasters, terrorism, war, and telecommunication, equipment and electrical failures. While we have not, to our knowledge, experienced any significant 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 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 results in a loss of or damage to our data or applications, or inappropriate disclosure or theft of confidential or proprietary information, we could incur liability, the further development of our product candidates could be delayed or our competitive position could be compromised.

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

We are exposed to the risk that our employees, independent contractors, principal investigators, CROs, consultants and vendors may engage in fraudulent or other illegal activity. Misconduct by these parties could include intentional, reckless and/or negligent conduct or disclosure of unauthorized activities to us that violates: (1) FDA regulations, including those laws requiring the reporting of true, complete and accurate information to the FDA; (2) manufacturing standards; (3) federal and state healthcare fraud and abuse laws and regulations; or (4) laws that require the true, complete and accurate reporting of financial information or data. Specifically, sales, marketing and business arrangements in the healthcare industry are subject to extensive laws and regulations intended to prevent fraud, kickbacks, self-dealing and other abusive practices. These laws and regulations may restrict or prohibit a wide range of pricing, discounting, marketing and promotion, sales commission, customer incentive programs and other

business arrangements. Activities subject to these laws also involve the improper use of information obtained in the course of clinical trials, which could result in regulatory sanctions and serious harm to our reputation. It is not always possible to identify and deter misconduct by our employees and other third parties, and the precautions we take to detect and prevent this activity may not be effective in controlling unknown or unmanaged risks or losses or in protecting us from governmental investigations or other actions or lawsuits stemming from a failure to be in compliance with such laws or regulations. If any such actions are instituted against us, and we are not successful in defending ourselves or asserting our rights, those actions could have a significant impact on our business, including the imposition of civil, criminal and administrative penalties, damages, monetary fines, possible exclusion from participation in Medicare, Medicaid and other federal healthcare programs, contractual damages, reputational harm, diminished profits and future earnings, and curtailment of our operations, any of which could adversely affect our ability to operate our business and our results of operations.

We incur significant costs as a result of operating as a public company, and our management devotes substantial time to new compliance initiatives.

Prior to our initial public offering ("IPO") in March 2014, we had not been subject to the reporting requirements of the Exchange Act of 1934, as amended (the "Exchange Act"), or the other rules and regulations of the Securities and Exchange Commission (the "SEC") or any securities exchange relating to public companies. We continue to identify those areas in which changes should be made to our financial and management control systems to manage our growth and our obligations as a public company. These areas include corporate governance, corporate control, disclosure controls and procedures and financial reporting and accounting systems. We have made, and will continue to make, changes in these and other areas. However, the expenses associated with being a public company could be material, particularly after we cease to be an "emerging growth company." Compliance with the various reporting and other requirements applicable to public companies require considerable time and attention of management. In addition, the changes we make may not be sufficient to allow us to satisfy our obligations as a public company on a timely basis.

In addition, certain types of insurance, including directors' and officers' liability insurance are more expensive as a public company. Being a public company could also make it more difficult for us to attract and retain qualified persons to serve on our board of directors, our board committees or as executive officers.

If we are not able to implement the requirements of Section 404 of the Sarbanes-Oxley Act of 2002 in a timely manner or with adequate compliance, we may be subject to sanctions by regulatory authorities.

Section 404 of the Sarbanes-Oxley Act of 2002 requires that we evaluate and determine the effectiveness of our internal controls over financial reporting and provide a management report on the internal control over financial reporting. If we have a material weakness in our internal controls over financial reporting, we may not detect errors on a timely basis and our financial statements may be materially misstated. We will be evaluating our internal controls systems to allow management to report on, and eventually our independent auditors will attest to, the effectiveness of the operation of our internal controls. We will be performing the system and process evaluation and testing (and any necessary remediation) required to comply with the management certification and eventual auditor attestation requirements of Section 404 of the Sarbanes-Oxley Act of 2002. The aforementioned auditor attestation requirements will not apply to us until we are no longer considered an "emerging growth company."

We cannot be certain as to the timing of completion of our evaluation, testing and remediation action or the impact of the same on our operations. If we are not able to comply with the requirements of Section 404 in a timely manner, or if we or our independent registered public accounting firm identifies deficiencies in our internal controls that are deemed to be material weaknesses, we could be subject to sanctions or investigations by The NASDAQ Stock Market LLC, the SEC or other regulatory authorities, which would entail expenditure of additional financial and management resources and could materially adversely affect our stock price. Deficient internal controls could also cause us to fail

to meet our reporting obligations or cause investors to lose confidence in our reported financial information, which could have a negative effect on our stock price.

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

We have designed our disclosure controls and procedures to reasonably assure that information we must disclose in reports we file or submit under the Exchange Act is accumulated and communicated to management, and recorded, processed, summarized and reported within the time periods specified in the rules and forms of the SEC.

We believe that any disclosure controls and procedures or internal controls and procedures, no matter how well-conceived and operated, can provide only reasonable, not absolute, assurance that the objectives of the control system are met.

These inherent limitations include the realities that judgments in decision-making can be faulty, and that breakdowns can occur because of simple errors or mistakes. Additionally, controls can be circumvented by the acts of some individuals, by collusion of two or more people or by an unauthorized override of the controls. Accordingly, because of the inherent limitations in our control system, misstatements due to error or fraud may occur and not be detected.

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

Our corporate headquarters is located in the San Francisco Bay Area, which in the past has experienced severe earthquakes. We do not carry earthquake insurance. Earthquakes or other natural disasters could severely disrupt our operations, and have a material adverse effect on our business, results of operations, financial condition and prospects.

If a natural disaster, power outage or other event occurred that prevented us from using all or a significant portion of our headquarters, that damaged critical infrastructure, such as our information technology systems, or that otherwise disrupted operations, it may be difficult or, in certain cases, impossible for us to continue our business for a substantial period of time. The disaster recovery and business continuity plans we have in place currently are limited and are unlikely to prove adequate in the event of a serious disaster or similar event. We may incur substantial expenses as a result of the limited nature of our disaster recovery and business continuity plans, which, particularly when taken together with our lack of earthquake insurance, could have a material adverse effect on our business.

Furthermore, integral parties in our supply chain are geographically concentrated and operating from single sites, increasing their vulnerability to natural disasters or other sudden, unforeseen and severe adverse events. If such an event were to affect our supply chain, it could have a material adverse effect on our business.

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

Under Sections 382 and 383 of the Internal Revenue Code of 1986, as amended, if a corporation undergoes an “ownership change” (generally defined as a greater than 50 percentage points change (by value) in the ownership of its equity by certain significant stockholders over a rolling three year period), the corporation’s ability to use its pre-change net operating loss carryforwards and certain other pre-change tax attributes to offset its post-change income and taxes may be limited. We may have experienced such ownership changes in the past, and we may experience ownership changes in the future and/or subsequent shifts in our stock ownership, some of which would be outside our control. If our ability to use our net operating losses and other tax attributes is limited by ownership changes, we may be unable to utilize a material portion of our net operating losses and other tax attributes.

Risks Related to Our U.S. Government Contracts

Our use of government funding for certain of our programs adds uncertainty to our research and commercialization efforts with respect to those programs and may impose requirements that increase the costs of commercialization and production of product candidates developed under those government-funded programs.

Our development of plazomicin as a countermeasure for diseases caused by antibiotic-resistant pathogens and biothreats is currently being funded in significant part through a contract with BARDA. We are also receiving funding from the National Institute of Allergy and Infectious Diseases ("NIAID") for one of our pre-clinical programs and we in the past received funding for other programs from the Defense Threat Reduction Agency ("DTRA") and from NIAID. Contracts funded by the U.S. government and its agencies, including our contract with BARDA, include provisions that reflect the government's substantial rights and remedies, many of which are not typically found in commercial contracts, including powers of the government to:

- terminate agreements, in whole or in part, for any reason or no reason;
- reduce or modify the government's obligations under such agreements without the consent of the other party;
- claim rights, including intellectual property rights, in products and data developed under such agreements;
- audit contract-related costs and fees, including allocated indirect costs;
- suspend the contractor from receiving new contracts pending resolution of alleged violations of procurement laws or regulations;
- impose U.S. manufacturing requirements for products that embody inventions conceived or first reduced to practice under such agreements;
- suspend or debar the contractor from doing future business with the government;
- control and potentially prohibit the export of products; and
- pursue criminal or civil remedies under the False Claims Act ("FCA"), the False Statements Act and similar remedy provisions specific to government agreements.

We may not have the right to prohibit the U.S. government from using or allowing others to use certain technologies developed by us, and we may not be able to prohibit third-party companies, including our competitors, from using those technologies in providing products and services to the U.S. government. The U.S. government generally obtains the right to royalty-free use of technologies that are developed under U.S. government contracts.

In addition, government contracts normally contain additional requirements that may increase our costs of doing business, reduce our profits, and expose us to liability for failure to comply with these terms and conditions. These requirements include, for example:

- specialized accounting systems unique to government contracts;
- mandatory financial audits and potential liability for price adjustments or recoupment of government funds after such funds have been spent;
- public disclosures of certain contract information, which may enable competitors to gain insights into our research program; and
- mandatory socioeconomic compliance requirements, including labor standards, anti-human-trafficking, non-discrimination, and affirmative action programs and environmental compliance requirements.

If we fail to maintain compliance with these requirements, we may be subject to potential contract or FCA liability and to termination of our contracts.

We are dependent on our BARDA contract to conclude portions of our plazomicin development and registration activities. If we do not receive all of the funds under this contract, we may be forced to obtain alternative sources of funding.

We expect $7.2 million of additional contractual revenue from our BARDA contract during the 2017 fiscal year. BARDA may terminate our contract at any time for convenience and there can be no assurances that this contract will not be terminated. Changes in government budgets and agendas may result in a decreased and de-prioritized emphasis on supporting the development of antibacterial products such as plazomicin. Although we are currently using a portion of the net proceeds from our debt and equity offerings to fund our plazomicin development program, any reduction or delay in BARDA funding may force us to seek alternative funding, which may not be available on non-dilutive terms, terms favorable to us or at all.

U.S. government agencies have special contracting requirements that give them the ability to unilaterally control our contracts.

U.S. government contracts typically contain unfavorable termination provisions and are subject to audit and modification by the government at its sole discretion, which will subject us to additional risks. These risks include the ability of the U.S. government to unilaterally:

- audit and object to our BARDA contract-related costs and fees, and require us to reimburse all such costs and fees;
- suspend or prevent us for a set period of time from receiving new contracts or extending our existing contracts based on violations or suspected violations of laws or regulations;
- cancel, terminate or suspend our contracts based on violations or suspected violations of laws or regulations;
- terminate our contracts if in the government's interest, including if funds become unavailable to the applicable governmental agency;
- reduce the scope and value of our contract; and
- change certain terms and conditions in our contract.

The U.S. government will be able to terminate any of its contracts with us, either for convenience or if we default by failing to perform in accordance with or to achieve the milestones set forth in the contract schedules and terms. Termination-for-convenience provisions generally enable us to recover only our costs incurred or committed and settlement expenses on the work completed prior to termination. Except for the amount of services received by the government, termination-for-default provisions do not permit these recoveries and would make us liable for excess costs incurred by the U.S. government in procuring undelivered items from another source.

The U.S. government's determination to award a future contract or contract option may be challenged by an interested party, such as another bidder, at the U.S. Government Accountability Office (the "GAO"), or in federal court. If such a challenge is successful, our BARDA contract or any future contract we may be awarded may be terminated.

The laws and regulations governing the procurement of goods and services by the U.S. government provide procedures by which other bidders and interested parties may challenge the award of a government contract. If we are awarded a government contract, such challenges or protests could be filed even if there are not any valid legal grounds on which to base the protest. If any such protests are filed, the government agency may decide to suspend our performance under the contract while such protests are being considered by the GAO or the applicable federal court, thus potentially delaying delivery of payment. In addition, we could be forced to expend considerable funds to defend any potential award. If a protest is successful, the government may be ordered to terminate any one or more of our contracts and reselect bids. The government agencies with which we have contracts could even be directed to award a potential contract to one of the other bidders.

Our business is subject to audit by the U.S. government, including under our contracts with BARDA and NIAID, and a negative outcome in an audit could adversely affect our business.

U.S. government agencies such as the Department of Health and Human Services ("DHHS") and the Defense Contract Audit Agency (the "DCAA") routinely audit and investigate government contractors. These agencies review a contractor's performance under its contracts, cost structure and compliance with applicable laws, regulations and standards.

The DHHS and the DCAA also review the adequacy of, and a contractor's compliance with, its internal control systems and policies, including the contractor's purchasing, property, estimating, compensation and management information systems. Any costs found to be improperly allocated to a specific contract will not be paid, while such costs already paid must be refunded. If an audit uncovers improper or illegal activities, we may be subject to civil and criminal penalties and administrative sanctions, including:

- termination of contracts;
- forfeiture of profits;
- suspension of payments;
- fines; and
- suspension or prohibition from conducting business with the U.S. government.

In addition, we could suffer serious reputational harm if allegations of impropriety were made against us, which could cause our stock price to decrease.

Laws and regulations affecting government contracts make it more expensive and difficult for us to successfully conduct our business.

We must comply with numerous laws and regulations relating to the formation, administration and performance of government contracts, which can make it more difficult for us to retain our rights under our BARDA contract. These laws and regulations affect how we conduct business with government agencies. Among the most significant government contracting regulations that affect our business are:

- the Federal Acquisition Regulations ("FAR") and agency-specific regulations supplemental to the FAR, which comprehensively regulate the procurement, formation, administration and performance of government contracts;
- business ethics and public integrity obligations, which govern conflicts of interest and the hiring of former government employees, restrict the granting of gratuities and funding of lobbying activities and include other requirements such as the Anti-Kickback Statute and Foreign Corrupt Practices Act;
- export and import control laws and regulations; and
- laws, regulations and executive orders restricting the use and dissemination of information classified for national security purposes and the exportation of certain products and technical data.

Any changes in applicable laws and regulations could restrict our ability to maintain our existing BARDA contract and obtain new contracts, which could limit our ability to conduct our business and materially adversely affect our results of operations.

Risks Related to Intellectual Property

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

We rely upon a combination of patents, trade secret protection and confidentiality agreements to protect the intellectual property related to our technologies. If we do not adequately protect our intellectual property, competitors may be able to use our technologies and erode or negate any competitive advantage we may have, which could harm our business and ability to achieve profitability. In particular, our success depends in large part on our ability to obtain and maintain patent protection in the United States and other countries with respect to our product candidates. However, we may not be able to file and prosecute all necessary or desirable patent applications at a reasonable cost or in a timely manner. We may also fail to identify patentable aspects of our research and development before it is too late to obtain patent protection.

Further, the patentability of inventions, and the validity, enforceability and scope of patents in the biotechnology and pharmaceutical field involve complex legal and scientific questions and can be uncertain. As a result, patent applications that we own or license may fail to result in issued patents in the United States or in other foreign countries for many reasons. For example, there is no assurance that we were the first to invent or the first to file patent applications in respect of the inventions claimed in our patent applications. Since patent applications in the United States and most other countries are confidential for a period of time after filing, we cannot be certain that we were the first to file any patent application related to our product candidates. We may also be unaware of certain prior art relating to our patent applications and patents, which could prevent a patent from issuing from a pending patent application, or result in an issued patent being invalidated. Even if patents have issued, or do successfully issue, from patent applications, third parties may challenge the validity, enforceability or scope thereof, which may result in such patents being narrowed, invalidated or held unenforceable. Furthermore, even if they are unchallenged, our patents and patent applications may not adequately protect our intellectual property or prevent others from designing around our claims. If the breadth or strength of protection provided by the patents and patent applications we hold, license or pursue with respect to our product candidates is threatened, it could threaten our ability to commercialize our product candidates. Further, if we encounter delays in our clinical trials, the period of time during which we could market any of our product candidates under patent protection, if approved, would be reduced. Changes to the patent laws in the United States and other jurisdictions could also diminish the value of our patents and patent applications or narrow the scope of our patent protection.

Further, one of our proposed development candidates, C-Scape, involves an innovative treatment combination of two previously-identified products. In addition to all of the risks and uncertainties with pharmaceutical candidates in general, these prior products have extensive patent and intellectual property portfolios that once protected them and may continue to protect certain aspects of these products. Such portfolios create additional risks and uncertainties for our own ability to obtain material patent or intellectual property protection on our combination development candidate. We believe that there is also the possibility that existing patents or applications relate to and cover combinations of these same products or product classes. Antibacterial products are commonly used in combination with one another in research, development and treatment. We may not be aware of all the ways these prior products have been used in combination and of the various intellectual property which may relate to such combination or combinations.

If we are unable to protect the confidentiality of our trade secrets, the value of our technology could be materially adversely affected and our business would be harmed.

In addition to the protection afforded by patents, we rely on confidential proprietary information, including trade secrets, and know-how to develop and maintain our competitive position. Any disclosure to or misappropriation by third parties of our confidential proprietary information could enable competitors to quickly duplicate or surpass our technological achievements, thus eroding our competitive position in our market. We seek to protect our confidential proprietary information, in part, by confidentiality agreements and invention assignment agreements with our employees, consultants, scientific advisors, contractors and collaborators. These agreements are designed to protect our proprietary information. However, we cannot be certain that such agreements have been entered into with all relevant parties, and we cannot be certain that our trade secrets and other confidential

proprietary information will not be disclosed or that competitors will not otherwise gain access to our trade secrets or independently develop substantially equivalent information and techniques. For example, any of these parties may breach the agreements and disclose our proprietary information, including our trade secrets, and we may not be able to obtain adequate remedies for such breaches. We also seek to preserve the integrity and confidentiality of our confidential proprietary information by maintaining physical security of our premises and physical and electronic security of our information technology systems, but it is possible that these security measures could be breached. If any of our confidential proprietary information were to be lawfully obtained or independently developed by a competitor, we would have no right to prevent such competitor from using that technology or information to compete with us, which could harm our competitive position. Further, the laws of some foreign countries, including China, where we currently source raw materials for plazomicin, do not protect proprietary rights to the same extent or in the same manner as the laws of the United States. As a result, we may encounter significant problems in protecting and defending our intellectual property both in the United States and abroad. If we are unable to prevent material disclosure of the intellectual property related to our technologies to third parties, we will not be able to establish or maintain a competitive advantage in our market, which could materially adversely affect our business, results of operations and financial condition.

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

There is a substantial amount of intellectual property litigation in the biotechnology and pharmaceutical industries, and we may become party to, or threatened with, litigation or other adversarial proceedings regarding intellectual property rights with respect to our technology or product candidates, including interference or derivation proceedings before the U.S. Patent and Trademark Office ("USPTO"). Third parties may assert infringement claims against us based on existing or future intellectual property rights. The outcome of intellectual property litigation is subject to uncertainties that cannot be adequately quantified in advance. The pharmaceutical and biotechnology industries have produced a significant number of patents, and it may not always be clear to industry participants, including us, which patents cover various types of products or methods of use. The coverage of patents is subject to interpretation by the courts, and the interpretation is not always uniform. If we are sued for patent infringement, we would need to demonstrate that our product candidates, products or methods either do not infringe the patent claims of the relevant patent or that the patent claims are invalid, and we may not be able to do this. Proving that a patent is invalid is difficult. For example, in the United States, proving invalidity requires a showing of clear and convincing evidence to overcome the presumption of validity enjoyed by issued patents. Even if we are successful in these proceedings, we may incur substantial costs and the time and attention of our management and scientific personnel could be diverted in pursuing these proceedings, which could have a material adverse effect on us. In addition, we may not have sufficient resources to bring these actions to a successful conclusion.

If we are found to infringe a third party's intellectual property rights, we could be forced, including by court order, to cease developing, manufacturing or commercializing the infringing product candidate or product. Alternatively, we may be required to obtain a license from such third party in order to use the infringing technology and continue developing, manufacturing or marketing the infringing product candidate. However, we may not be able to obtain any required license on commercially reasonable terms or at all. Even if we were able to obtain a license, it could be non-exclusive, thereby giving our competitors access to the same technologies licensed to us. In addition, we could be found liable for monetary damages, including treble damages and attorneys' fees if we are found to have willfully infringed a patent. A finding of infringement could prevent us from commercializing our product candidates or force us to cease some of our business operations, which could materially harm our business. We may also elect to enter into license agreements in order to settle patent infringement claims or to resolve disputes prior to litigation, and any such license agreements may require us to pay royalties and other fees that could be significant. Claims that we have misappropriated the confidential information or trade secrets of third parties could have a similar negative impact on our business.

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

Competitors may infringe or otherwise violate our patents, the patents of our licensors, or our other intellectual property rights. To counter infringement or unauthorized use, we may be required to file infringement claims, which can be expensive and time-consuming. Any claims that we assert against perceived infringers could also provoke these parties to assert counterclaims against us alleging that we infringe their intellectual property

rights. In addition, in an infringement proceeding, a court may decide that a patent of ours is not valid or is unenforceable, in whole or in part, or may refuse to stop the other party in such infringement proceeding from using the technology at issue on the grounds that our patents do not cover the technology in question. An adverse result in any litigation or defense proceedings could put one or more of our patents at risk of being invalidated, held unenforceable or interpreted narrowly, and could put any of our patent applications at risk of not yielding an issued patent.

Interference or derivation proceedings provoked by third parties or brought by the USPTO or any foreign patent authority may be necessary to determine the priority of inventions or other matters of inventorship with respect to our patents or patent applications. We may also become involved in other proceedings, such as re-examination or opposition proceedings, before the USPTO or its foreign counterparts relating to our intellectual property or the intellectual property rights of others. An unfavorable outcome in any such proceedings could require us to cease using the related technology or to attempt to license rights to it from the prevailing party, or could cause us to lose valuable intellectual property rights. Our business could be harmed if the prevailing party does not offer us a license on commercially reasonable terms, if any license is offered at all. Litigation or other proceedings may fail and, even if successful, may result in substantial costs and distract our management and other employees. We may also become involved in disputes with others regarding the ownership of intellectual property rights. For example, we jointly develop intellectual property with certain parties, and disagreements may therefore arise as to the ownership of the intellectual property developed pursuant to these relationships. If we are unable to resolve these disputes, we could lose valuable intellectual property rights.

We may not be able to prevent misappropriation of our trade secrets or confidential information, particularly in countries where the laws may not protect those rights as fully as in the United States. Furthermore, because of the substantial amount of discovery required in connection with intellectual property litigation, there is a risk that some of our confidential information could be compromised by disclosure during this type of litigation. In addition, there could be public announcements of the results of hearings, motions or other interim proceedings or developments. If securities analysts or investors perceive these results to be negative, it could have a substantial adverse effect on the price of our common stock.

Even if resolved in our favor, litigation or other legal proceedings relating to intellectual property claims may cause us to incur significant expenses, and could distract our technical and/or management personnel from their normal responsibilities. In addition, there could be public announcements of the results of hearings, motions or other interim proceedings or developments and if securities analysts or investors perceive these results to be negative, it could have a substantial adverse effect on the market price of our common stock. Such litigation or proceedings could substantially increase our operating losses and reduce the resources available for development activities or any future sales, marketing or distribution activities. Uncertainties resulting from the initiation and continuation of intellectual property litigation or other proceedings could have a material adverse effect on our ability to compete in the marketplace.

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

Filing, prosecuting and defending patents on all of our product candidates throughout the world would be prohibitively expensive. Competitors may use our technologies in jurisdictions where we have not obtained patent protection to develop their own products and, further, may export otherwise infringing products to territories where we have patent protection but where enforcement is not as strong as in the United States. These products may compete with our products in jurisdictions where we do not have any issued patents and our patent claims or other intellectual property rights may not be effective or sufficient to prevent them from so competing. Many companies have encountered significant problems in protecting and defending intellectual property rights in foreign jurisdictions, including China, where we currently source raw materials for plazomicin. The legal systems of certain countries,

particularly certain developing countries, do not favor the enforcement of patents and other intellectual property protection, particularly those relating to biopharmaceuticals, which could make it difficult for us to stop the infringement of our patents or marketing of competing products in violation of our proprietary rights generally. Proceedings to enforce our patent rights in foreign jurisdictions could result in substantial cost and divert our efforts and attention from other aspects of our business.

If we breach any of the agreements under which we license the use, development and commercialization rights to our product candidates from third parties, we could lose license rights that are important to our business.

While the primary patent family covering plazomicin is Achaogen-owned, our development and commercialization of plazomicin is subject to our license agreement with Ionis Pharmaceuticals, Inc. (formerly known as Isis Pharmaceuticals, Inc.), and a portion of the patent portfolio for our LpxC inhibitor program is in-licensed from UW. Under our existing license agreements, we are subject to various obligations, including diligence obligations with respect to development and commercialization activities, payment obligations for achievement of certain milestones and royalties on product sales, as well as other material obligations. If we fail to comply with any of these obligations or otherwise breach our license agreements, our licensing collaborators may have the right to terminate the applicable license in whole or in part. The loss of our license agreement with Ionis Pharmaceuticals, Inc. could materially adversely affect our ability to proceed with the development or potential commercialization of plazomicin as currently planned, while the loss of our license agreement with UW could materially adversely affect our ability to proceed with any development or potential commercialization of our LpxC inhibitor program.

The risks described elsewhere pertaining to our patents and other intellectual property rights also apply to the intellectual property rights that we license, and any failure by us or our licensors to obtain, maintain and enforce these rights could have a material adverse effect on our business. In some cases, we do not have control over the prosecution, maintenance or enforcement of the patents that we license, and may not have sufficient ability to consult and input into the patent prosecution and maintenance process with respect to such patents, and our licensors may fail to take the steps that we believe are necessary or desirable in order to obtain, maintain and enforce the licensed patents.

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

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

- others may be able to make compounds that are similar to our product candidates but that are not covered by the claims of the patents that we own or license;
- we or our licensors or collaborators might not have been the first to make the inventions covered by an issued patent or pending patent application that we own or license;
- we or our licensors or collaborators might not have been the first to file patent applications covering an invention;
- others may independently develop similar or alternative technologies or duplicate any of our technologies without infringing our intellectual property rights;
- pending patent applications that we own or license may not lead to issued patents;
- issued patents that we own or license may not provide us with any competitive advantages, or may be held invalid or unenforceable, as a result of legal challenges by our competitors;
- our competitors might conduct research and development activities in countries where we do not have patent rights and then use the information learned from such activities to develop competitive products for sale in our major commercial markets;
- we may not develop or in-license additional proprietary technologies that are patentable; and
- the patents of others may have an adverse effect on our business.

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

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

Periodic maintenance fees, renewal fees, annuity fees and various other governmental fees on patents and/or applications will be due to be paid to the USPTO and various governmental patent agencies outside of the United States in several stages over the lifetime of the patents and/or applications. The USPTO and various non-U.S. governmental patent agencies require compliance with a number of procedural, documentary, fee payment and other similar provisions during the patent application process. In many cases, an inadvertent lapse can be cured by payment of a late fee or by other means in accordance with the applicable rules. However, there are situations in which noncompliance can result in abandonment or lapse of the patent or patent application, resulting in partial or complete loss of patent rights in the relevant jurisdiction. In such an event, our competitors might be able to use our technologies and this circumstance would have a material adverse effect on our business.

Provisions in our U.S. government contracts, including our contract with BARDA, may affect our intellectual property rights.

Certain of our activities have been funded, and may in the future be funded, by the U.S. government, including our contract with BARDA. When new technologies are developed with U.S. government funding, the government obtains certain rights in any resulting patents, including the right to a nonexclusive license authorizing the government to use the invention. These rights may permit the government to disclose our confidential information to third parties and to exercise “march-in” rights to use or allow third parties to use our patented technology. The government can exercise its march-in rights if it determines that action is necessary because we fail to achieve practical application of the U.S. government-funded technology, because action is necessary to alleviate health or safety needs, to meet requirements of federal regulations, or to give preference to U.S. industry. In addition, U.S. government-funded inventions must be reported to the government, U.S. government funding must be disclosed in any resulting patent applications, and our rights in such inventions may be subject to certain requirements to manufacture products in the United States.

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

On September 16, 2011, the Leahy-Smith America Invents Act (the “Leahy-Smith Act”) was signed into law. The Leahy-Smith Act includes a number of significant changes to U.S. patent law. These include provisions that affect the way patent applications will be prosecuted and may also affect patent litigation. The USPTO has promulgated regulations and developed procedures to govern administration of the Leahy-Smith Act, and many of the substantive changes to patent law associated with the Leahy-Smith Act, and in particular, the first to file provisions, did not come into effect until March 16, 2013. Accordingly, it is not yet clear what, if any, impact the Leahy-Smith Act will have on the operation of our business. However, the Leahy-Smith Act and its implementation could increase the uncertainties and costs surrounding the prosecution of our patent applications and the enforcement or defense of our issued patents, all of which could have a material adverse effect on our business and financial condition.

We may be subject to claims that our employees or consultants have wrongfully used or disclosed alleged trade secrets of former or other employers.

Many of our employees and consultants, including our senior management, have been employed or retained by other biotechnology or pharmaceutical companies, including our competitors or potential competitors. Although we try to ensure that our employees and consultants 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 or consultants have used or disclosed intellectual property, including trade secrets or other proprietary information, of any such employee’s or consultant’s former or

other employer. We are not aware of any material threatened or pending claims related to these matters, but in the future litigation may be necessary to defend against such 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 could result in substantial costs and be a distraction to management.

If we do not obtain patent term extension in the United States under the Hatch-Waxman Act and in foreign countries under similar legislation, thereby potentially extending the term of our marketing exclusivity for our product candidates, our business may be materially harmed.

Depending upon the timing, duration and specifics of FDA marketing approval of our product candidates, if any, one or more of our U.S. patents, if any, covering our approved product(s) or the use thereof may be eligible for up to five years of patent term restoration under the Hatch-Waxman Act. The Hatch-Waxman Act allows a maximum of one patent to be extended per FDA approved product. Patent term extension also may be available in certain foreign countries upon regulatory approval of our product candidates. Nevertheless, we may not be granted patent term extension either in the United States or in any foreign country because of, for example, failing to apply within applicable deadlines, failing to apply prior to expiration of relevant patents or otherwise failing to satisfy applicable requirements. Moreover, the term of extension, as well as the scope of patent protection during any such extension, afforded by the governmental authority could be less than we request.

If we are unable to obtain patent term extension or restoration, or the term of any such extension is less than we request, the period during which we will have the right to exclusively market our product will be shortened and our competitors may obtain approval of competing products following our patent expiration, and our revenue could be reduced, possibly materially.

Risks Related to Government Regulation

The regulatory approval process is expensive, time consuming and uncertain and may prevent us from obtaining, or cause delays in obtaining, approvals for the commercialization of some or all of our product candidates, which will materially impair our ability to generate revenue.

The design, development, research, testing, manufacturing, labeling, storage, recordkeeping, approval, selling, import, export, advertising, promotion, and distribution of drug products are subject to extensive and evolving regulation by federal, state and local governmental authorities in the United States, principally by the FDA, and foreign regulatory authorities, with regulations differing from country to country. Failure to obtain marketing approval for a product candidate will prevent us from commercializing the product candidate. Neither we nor any future collaboration partner is permitted to market plazomicin or any other product candidate in the United States until we receive regulatory approval of an NDA from the FDA.

We have not submitted an application or obtained marketing approval for plazomicin or any other product candidate anywhere in the world. An NDA must include extensive preclinical and clinical data and supporting information to establish to the FDA's satisfaction the product candidate's safety and efficacy for each desired indication. The NDA must also include significant information regarding the chemistry, manufacturing and controls for the product candidate. Obtaining regulatory approval of an NDA 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:

- warning letters;
- civil and criminal penalties;
- injunctions;
- withdrawal of approved products;
- product seizure or detention;
- product recalls;
- total or partial suspension of production; and
- refusal to approve pending NDAs or supplements to approved NDAs.

Prior to receiving approval to commercialize any of our product candidates in the United States or abroad, we and any applicable 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. Preclinical testing and clinical trials are long, expensive and uncertain processes. We may spend several years completing our testing for any particular product candidate, and failure can occur at any stage. Negative or inconclusive results or adverse medical events during a clinical trial could also cause the FDA or us to terminate a clinical trial or require that we repeat it or conduct additional clinical trials. Additionally, data obtained from preclinical studies and clinical trials can be interpreted in different ways and the FDA or other regulatory authorities may interpret the results of our studies and trials less favorably than we do. Even if we believe the preclinical or clinical data for a product candidate is promising, such data may not be sufficient to support approval by the FDA and other regulatory authorities. Administering any product candidates to humans may produce undesirable side effects, which could interrupt, delay or halt clinical trials of such product candidates and result in the FDA or other regulatory authorities denying approval of such product candidates for any or all targeted indications. The FDA or other regulatory authorities may determine that plazomicin or any other product candidate that we develop is not effective, or is only moderately effective, or has undesirable or unintended side effects, toxicities, safety profile or other characteristics that preclude marketing approval or prevent or limit commercial use. In addition, any marketing approval we ultimately obtain may be limited or subject to restrictions or post-approval commitments that render the approved product not commercially viable.

The regulatory approval process is expensive and may take several years to complete. The FDA and foreign regulatory entities have 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:

- 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 may request additional analyses, reports, data and studies;
- the FDA may ask questions regarding, or adopt different interpretations of, data and results;
- the FDA might not approve our or our third-party manufacturer's processes or facilities; or
- the FDA may change its approval policies or adopt new regulations.

Although we have received FDA fast-track designation for our development of plazomicin to treat serious CRE infections, we cannot guarantee that we will experience a faster review or approval process compared to conventional FDA procedures. The FDA may withdraw fast-track designation if it believes that the designation is no longer supported by data from our clinical development program.

If any of our product candidates fails to demonstrate safety and efficacy in clinical trials or does not gain regulatory approval, or if we experience delays in obtaining regulatory approval, our business and results of operations will be materially and adversely 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 restrictions, withdrawal from the market, or penalties if we fail to comply with applicable regulatory requirements or if we experience unanticipated problems with our product candidates, when and if approved.

Once 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 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 studies or surveillance 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 labeling, packaging, adverse event reporting, storage, distribution, advertising, promotion,

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

The FDA closely regulates the post-approval marketing and promotion of drugs to ensure drugs are marketed only for the approved indications and in accordance with the provisions of the approved labeling and regulatory requirements. The FDA also imposes stringent restrictions on manufacturers' communications regarding off-label use and if we do not restrict the marketing of our products only to their approved indications, we may be subject to enforcement action for off-label marketing. If we, our product candidates or the manufacturing facilities for our product candidates 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:

- warning letters or untitled letters;
- mandated modifications to promotional materials or the required provision of corrective information to healthcare practitioners;
- restrictions imposed on the product or its manufacturers or manufacturing processes;
- restrictions imposed on the labeling or marketing of the product;
- restrictions imposed on product distribution or use;
- requirements for post-marketing clinical trials;
- suspension of any ongoing clinical trials;
- suspension of or withdrawal of regulatory approval;
- voluntary or mandatory product recalls and publicity requirements;
- refusal to approve pending applications for marketing approval of new products or supplements to approved applications filed by us;
- restrictions on operations, including costly new manufacturing requirements;
- seizure or detention of our products;
- refusal to permit the import or export of our products;
- required entry into a consent decree, which can include imposition of various fines (including restitution or disgorgement of profits or revenue), reimbursements for inspection costs, required due dates for specific actions and penalties for noncompliance;
- civil or criminal penalties; or
- injunctions.

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

The regulatory requirements and policies may change and additional government regulations may be enacted for which we may also be required to comply. For example, in December 2016, the 21st Century Cures Act, or Cures Act, was signed into law. The Cures Act, among other things, is intended to modernize the regulation of drugs and spur innovation, but its ultimate implementation is unclear. If we are slow or unable to adapt to changes in existing requirements or the adoption of new requirements or policies, or if we or any future collaboration partner are not able to maintain regulatory compliance, we may lose any marketing approval that we may have obtained, which would adversely affect our business, prospects and ability to achieve or sustain profitability.

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. For example, certain policies of the current administration may impact our business and industry. The current administration has taken several executive actions, including the issuance of a number of Executive Orders, that could impose significant burdens on, or otherwise materially delay, FDA's ability to engage in routine regulatory and oversight activities such as implementing statutes through rulemaking, issuance of guidance, and review and approval of marketing applications. Notably, on January 23, 2017, a hiring freeze was ordered for all executive departments and agencies, including the FDA, which prohibits the FDA from filling employee vacancies or creating new positions. Under the terms of the order, the freeze will remain in effect until implementation of a plan to be recommended by the Director for the Office of Management and Budget, or OMB, in consultation with the Director of the Office of Personnel Management, to reduce the size of the federal workforce through attrition. An under-staffed FDA could result in delays in FDA's responsiveness or in its ability to review submissions or applications, issue regulations or guidance, or implement or enforce regulatory requirements in a timely fashion or at all. Moreover, on January 30, 2017, an Executive Order was issued, applicable to all executive agencies, including the FDA, that requires that for each notice of proposed rulemaking or final regulation to be issued in fiscal year 2017, the agency shall identify at least two existing regulations to be repealed, unless prohibited by law. These requirements are referred to as the "two-for-one" provisions. This Executive Order includes a budget neutrality provision that requires the total incremental cost of all new regulations in the 2017 fiscal year, including repealed regulations, to be no greater than zero, except in limited circumstances. For fiscal years 2018 and beyond, the Executive Order requires agencies to identify regulations to offset any incremental cost of a new regulation and approximate the total costs or savings associated with each new regulation or repealed regulation. In interim guidance issued by the Office of Information and Regulatory Affairs within OMB on February 2, 2017, the administration indicates that the "two-for-one" provisions may apply not only to agency regulations, but also to significant agency guidance documents. It is difficult to predict how these requirements will be implemented, and the extent to which they will impact the FDA's ability to exercise its regulatory authority. If these executive actions impose constraints on FDA's ability to engage in oversight and implementation activities in the normal course, our business may be negatively impacted.

Failure to obtain regulatory approvals in foreign jurisdictions will prevent us from marketing our product candidates internationally.

We may seek a distribution and marketing collaborator for plazomicin or other product candidates commercialized outside of the United States. In order to market our product candidates in the European Economic Area (the "EEA"), which is comprised of the 28 Member States of the EU, plus Norway, Iceland and Liechtenstein), and many other foreign jurisdictions, we or our collaboration partners must obtain separate regulatory approvals. More concretely, in the EEA, medicinal products can only be commercialized after obtaining a Marketing Authorization ("MA"). There are

two types of marketing authorizations:

- the Community MA, which is issued by the European Commission through the Centralized Procedure, based on the opinion of the Committee for Medicinal Products for Human Use of the EMA, and which is valid throughout the entire territory of the EEA. The Centralized Procedure is mandatory for certain types of products, such as for drugs produced through certain specified biotechnological processes (such as recombinant DNA technology, controlled expression of genes coding for biologically active proteins in prokaryotes and eukaryotes including transformed mammalian cells, and hybridoma and monoclonal

antibody methods), advanced therapy medicinal products, orphan medicinal products, and medicinal products indicated for the treatment of AIDS, cancer, neurodegenerative disorders, diabetes, auto-immune and viral diseases. The Centralized Procedure is optional for products containing a new active substance not yet authorized in the EEA, or for products that constitute a significant therapeutic, scientific or technical innovation or which are in the interest of public health in the EU.

- national MAs, which are issued by the competent authorities of the Member States of the EEA and only cover their respective territory, are available for products not falling within the mandatory scope of the Centralized Procedure. Where a product has already been authorized for marketing in a Member State of the EEA, this National MA can be recognized in another Member State through the Mutual Recognition Procedure. If the product has not received a National MA in any Member State at the time of application, it can be approved simultaneously in various Member States through the Decentralized Procedure.

Under the above described procedures, before granting the MA, the EMA or the competent authorities of the Member States of the EEA make an assessment of the risk-benefit balance of the product on the basis of scientific criteria concerning its quality, safety and efficacy.

We have had limited interactions with foreign regulatory authorities, and approval procedures vary among countries and can involve additional clinical testing. In addition, the time required to obtain approval from foreign regulatory authorities 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 our ability to obtain approval in other countries. The foreign regulatory approval process generally includes all of the risks associated with obtaining FDA approval. In addition, in many countries outside the United States, it is required that the product be approved for reimbursement before the product can be approved for sale in that country. We may or 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 product candidates 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 that could affect our future revenue and profitability and the future revenue and profitability of our potential customers. Federal and state lawmakers regularly propose and, at times, enact legislation that results in significant changes to the healthcare system, some of which is intended to contain or reduce the costs of medical products and services. For example, in March 2010, the President signed one of the most significant healthcare reform measures in decades, the Affordable Care Act ("ACA"). It contains a number of provisions, including those governing enrollment in federal healthcare programs, reimbursement changes and fraud and abuse measures, all of which will impact existing government healthcare programs and will result in the development of new programs. The ACA, among other things:

- imposes a non-deductible annual fee on pharmaceutical manufacturers or importers who sell "branded prescription drugs" to specified federal government programs;
- increases the minimum level of Medicaid rebates payable by manufacturers of brand-name drugs from 15.1% to 23.1%;
- imposes a 2.3% medical device excise tax that manufacturers and importers will be required to pay on their sales of certain medical devices, which, under the Consolidated Appropriations Act, 2016, is suspended from January 1, 2016 to December 31, 2017, and, absent further legislative action, will be reinstated starting January 1, 2018;
- requires collection of rebates for drugs paid by Medicaid managed care organizations;

- addresses new methodologies by which rebates owed by manufacturers under the Medicaid Drug Rebate Program are calculated for drugs that are inhaled, infused, instilled, implanted or injected, and for drugs that are line extension products;
- requires manufacturers to participate in a coverage gap discount program, under which they must agree to offer 50% point-of-sale discounts off negotiated prices of applicable brand drugs to eligible beneficiaries during their coverage gap period, as a condition for the manufacturer's outpatient drugs to be covered under Medicare Part D; and
- expands eligibility criteria for Medicaid programs by, among other things, allowing states to offer Medicaid coverage to additional individuals and by adding new mandatory eligibility categories for certain individuals with income at or below 133% of the federal poverty level, thereby potentially increasing a manufacturer's Medicaid rebate liability.

We expect that the new presidential administration and U.S. Congress will seek to modify, repeal, or otherwise invalidate all or certain provisions of, the ACA. In January 2017, the House and Senate passed a budget resolution that authorizes congressional committees to draft legislation to repeal all or portions of the ACA and permits such legislation to pass with a majority vote in the Senate. There is still uncertainty with respect to the impact the current administration and the U.S. Congress may have, if any, and any changes will likely take time to unfold, and could have an impact on coverage and reimbursement for healthcare items and services covered by plans that were authorized by the ACA.

Other legislative changes have been proposed and adopted in the United States since the ACA was enacted. These changes included aggregated reductions to Medicare payments to providers of up to 2% per fiscal year, which went into effect on April 1, 2013, and, due to subsequent legislative amendments, 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, which, among other things, further reduced Medicare payments to several providers, including hospitals, imaging centers and cancer treatment centers, and increased the statute of limitations period for the government to recover overpayments to providers from three to five years. Recently, there has also been heightened governmental scrutiny over the manner in which drug manufacturers set prices for their marketed products, which has resulted in several Congressional inquiries and proposed bills designed to, among other things, bring more transparency to product pricing, review the relationship between pricing and manufacturer patient programs, and reform government program reimbursement methodologies for drug products. We expect that additional state and federal healthcare reform measures will be adopted in the future, any of which could limit the amounts that federal and state governments will pay for healthcare products and services, which could result in reduced demand for our products once approved or additional pricing pressures.

We are subject to healthcare laws, regulation and enforcement and our failure to comply with those laws could adversely affect our business, operations and financial condition.

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 pertaining to fraud and abuse and patients' rights are and will be applicable to our business. We could be subject to healthcare fraud and abuse and patient privacy regulation by both the federal government and the states in which we conduct our business. The regulations that may affect our ability to operate include, without limitation:

- the federal Anti-Kickback Statute, which prohibits, among other things, any person from knowingly and willfully offering, soliciting, receiving or providing remuneration, directly or indirectly, to induce either the referral of an individual, for an item or service or the purchasing or ordering of a good or service, for which payment may be made under federal healthcare programs such as the Medicare and Medicaid programs;
- the federal False Claims Act, which prohibits, among other things, individuals or entities from knowingly presenting, or causing to be presented, false claims, or knowingly using false statements, to obtain payment from the federal government, and which may apply to entities that provide coding and billing advice to customers;

- federal criminal laws that prohibit executing a scheme to defraud any healthcare benefit program or making false statements relating to healthcare matters;
- the federal physician sunshine requirements under the ACA, which requires manufacturers of drugs, devices, biologics, and medical supplies to report annually to the Centers for Medicare & Medicaid Services information related to payments and other transfers of value to physicians, other healthcare providers, and teaching hospitals, and ownership and investment interests held by physicians and other healthcare providers and their immediate family members;
- the federal Health Insurance Portability and Accountability Act of 1996, as amended by the Health Information Technology for Economic and Clinical Health Act, which governs the conduct of certain electronic healthcare transactions and protects 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 applicable compliance guidance promulgated by the federal government, or otherwise restrict payments that may be made to healthcare providers and other potential referral sources; state laws that require drug manufacturers to report information related to payments and other transfers of value to physicians and other healthcare providers or marketing expenditures and pricing information; and state laws governing the privacy and security of health information in certain circumstances, many of which differ from each other in significant ways and may not have the same effect, thus complicating compliance efforts.

Because of the breadth of these laws and the narrowness of the statutory exceptions and safe harbors available, it is possible that some of our business activities could be subject to challenge under one or more of such laws. In addition, recent healthcare reform legislation has strengthened these laws. For example, the recently enacted 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 the statute or specific intent to violate it. 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.

Achieving and sustaining compliance with these laws may prove costly. In addition, any action against us for violation of these laws, even if we successfully defend against it, could cause us to incur significant legal and other related expenses and divert our management's attention from the operation of our business. If our operations are found to be in violation of any of the laws described above or any other governmental laws and regulations that apply to us, we may be subject to penalties, including civil and criminal penalties, damages, fines, the exclusion from participation in federal and state healthcare programs, imprisonment, or the curtailment or restructuring of our operations, any of which could adversely affect our ability to operate our business and our financial results.

Risks Related to Our Common Stock

The price of our common stock may be volatile and our stockholders may not be able to resell shares of our common stock at or above the price they paid.

There was no public market for our common stock prior to our IPO in March 2014, the trading volume of our common stock on The NASDAQ Global Market has been limited since then, and there can be no assurance that an active and liquid trading market for our common stock will be sustained. We cannot predict the extent to which investor interest in our company will lead to the development of or sustain an active trading market on The NASDAQ Global Market or otherwise or how liquid that market might become. If an active public market is not sustained, it may be difficult for stockholders to sell their shares of common stock at prices that are attractive to them, or at all. Further, an inactive market may also impair our ability to raise capital by selling shares of our common stock and may impair our ability to enter into strategic partnerships or acquire companies or products, product candidates or technologies by using our shares of common stock as consideration. The trading price of our common stock is highly

volatile and could be subject to wide fluctuations in response to various factors, some of

which are beyond our control. Factors that could cause volatility in the market price of our common stock include, but are not limited to:

- announcements relating to our current development and commercialization program for product candidates, including but not limited to plazomicin;
- results from, or any delays in, clinical trial programs relating to our product candidates;
- delays in commercializing or obtaining regulatory approval for our product candidates;
- any need to suspend or discontinue clinical trials due to side effects or other safety risks, or any need to conduct studies on the long-term effects associated with the use of our product candidates;
- capital fundraising or other financing activities that contain onerous or unfavorable terms;
- manufacturing issues related to our product candidates for clinical trials or future products for commercialization;
- commercial success and market acceptance of our product candidates following regulatory approval;
- undesirable side effects caused by product candidates after they have entered the market;
- spread of bacterial resistance to our product candidates;
- ability to discover, develop and commercialize additional product candidates;
- announcements relating to collaborations that we may enter into with respect to the development or commercialization of our product candidates, or the timing of payments we may make or receive under these arrangements;
- announcements relating to the receipt, modification or termination of government contracts or grants, or the timing of payments we may receive under these arrangements;
- success of our competitors in discovering, developing or commercializing products;
- delay or failure to successfully develop, validate and obtain regulatory clearance or approval of plazomicin in vitro diagnostic assay;
- strategic transactions undertaken by us;
- additions or departures of key personnel;
- product liability claims related to our clinical trials or product candidates;
- prevailing economic conditions;
- business disruptions caused by earthquakes or other natural disasters;
- disputes concerning our intellectual property or other proprietary rights;
- litigation or the threat of litigation;
- FDA or other U.S. or foreign regulatory actions affecting us or our industry;
- healthcare reform measures in the United States or other countries;
- sales of our common stock by our officers, directors or significant stockholders;
- future sales or issuances of equity or debt securities by us;

- fluctuations in our quarterly operating results; and
- the issuance of new or changed securities analysts' reports or recommendations regarding us.

In addition, the stock markets in general, and the markets for pharmaceutical, biopharmaceutical and biotechnology stocks in particular, have experienced extreme volatility that has been often unrelated to the operating performance of the issuer. These broad market fluctuations may adversely affect the trading price or liquidity of our common stock. In the past, when the market price of a stock has been volatile, holders of that stock have sometimes instituted securities class action litigation against the issuer. If any of our stockholders were to bring such a lawsuit against us, we could incur substantial costs defending the lawsuit and the attention of our management would be diverted from the operation of our business, which could seriously harm our financial position. Any adverse determination in litigation could also subject us to significant liabilities.

Our principal stockholders and management own a significant percentage of our stock and will be able to exert significant control over matters subject to stockholder approval.

As of December 31, 2016 our executive officers, directors, and their respective affiliates beneficially owned approximately 8% of our outstanding voting stock. Accordingly, these stockholders may continue to have significant influence over the outcome of corporate actions requiring stockholder approval, including the election of directors, any merger, consolidation or sale of all or substantially all of our assets or any other significant corporate transaction. The interests of these stockholders may not be the same as or may even conflict with your interests. For example, these stockholders could delay or prevent a change of control of our company, even if such a change of control would benefit our other stockholders, which could deprive our stockholders of an opportunity to receive a premium for their common stock as part of a sale of our company or our assets and might affect the prevailing market price of our common stock. The concentration of stock ownership may adversely affect the trading price of our common stock due to investors' perception that conflicts of interest may exist or arise.

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

We are an "emerging growth company," as defined in the JOBS Act, and may take advantage of certain exemptions from various reporting requirements that are applicable to other public companies that are not "emerging growth companies" including not being required to comply with the auditor attestation requirements of section 404 of the Sarbanes-Oxley Act, reduced disclosure obligations regarding executive compensation in our periodic reports and proxy statements and exemptions from the requirements of holding a nonbinding advisory vote on executive compensation and stockholder approval of any golden parachute payments not previously approved. We cannot predict if investors will find our common stock less attractive because we may rely on these exemptions. If some investors find our common stock less attractive as a result, there may be a less active trading market for our common stock and our stock price may be more volatile.

In addition, Section 102 of the JOBS Act also provides that an "emerging growth company" can take advantage of the extended transition period provided in Section 7(a)(2)(B) of the Securities Act for complying with new or revised accounting standards. An "emerging growth company" can therefore delay the adoption of certain accounting standards until those standards would otherwise apply to private companies. However, we have chosen to "opt out" of such extended transition period, and as a result, we will comply with new or revised accounting standards on the relevant dates on which adoption of such standards is required for non-emerging growth companies. Section 107 of the JOBS Act provides that our decision to opt out of the extended transition period for complying with new or revised accounting standards is irrevocable.

Raising additional funds by issuing securities or through licensing or lending arrangements may cause dilution to our existing stockholders, restrict our operations or require us to relinquish proprietary rights.

To the extent that we raise additional capital by issuing equity securities, the share ownership of existing stockholders will be diluted. For example, on April 7, 2015, we filed a Registration Statement on Form S-3 (File No. 333-203282), (the "Shelf Registration Statement"), covering the offering of up to $150 million of common stock, preferred stock, debt securities, warrants, purchase contracts and units. The Shelf Registration Statement included a prospectus covering the offering, issuance and sale of up to $30.0 million of shares of our common stock from time to time in "at the market" ("ATM") offerings pursuant to a Common Stock Sales Agreement entered into with

Cowen and Company, LLC (the "Sales Agreement") on April 7, 2015. Through December 31, 2016, we have sold 1,105,549 shares of common stock under the Sales Agreement, at a weighted-average price of approximately $4.82 per share for aggregate gross proceeds of $5.3 million.

As of December 31, 2016, approximately $43.8 million in securities remained unissued under the Shelf Registration Statement, including up to $24.7 million of common stock available to be sold under the Sales Agreement, subject to certain conditions specified therein.

In June 2016, we issued 7,999,996 shares of its common stock and warrants to purchase 1,999,999 shares of its common stock for aggregate gross proceeds of $25.4 million in connection with the Private Placement. Any future debt financing may involve covenants that restrict our operations, including, among other restrictions, limitations on our ability to incur liens or additional debt, pay dividends, redeem our stock, make certain investments, and engage in certain merger, consolidation, or asset sale transactions. In addition, if we raise additional funds through licensing arrangements, it may be necessary to grant potentially valuable rights to our product candidates or grant licenses on terms that are not favorable to us. Further, we may choose to raise additional capital due to market conditions or strategic considerations even if we believe we have sufficient funds for our current or future operating plans. To the extent that additional capital is raised through the sale of equity or convertible debt securities, including under our ATM, the issuance of these securities could result in further dilution to our stockholders or result in downward pressure on the price of our common stock.

Future sales by our existing holders of our common stock or securities convertible or exchangeable for our common stock may depress our stock price.

If our existing stockholders or holders of our options or warrants sell, or indicate an intention to sell, substantial amounts of our common stock in the public market, the market price of our common stock could decline. The perception in the market that these sales may occur could also cause the trading price of our common stock to decline. As of December 31, 2016, we have outstanding a total of 35,638,052 shares of common stock. Other than any shares held by our directors, officers and certain existing investors, all of these are currently freely tradable.

In addition, based on the number of shares subject to outstanding awards under our Amended and Restated 2003 Stock Plan (the "2003 Plan") or subject to outstanding awards or available for issuance under our 2014 Equity Incentive Award Plan (our "2014 Plan"), our 2014 Employment Commencement Incentive Plan (our "Inducement Plan") and our 2014 Employee Stock Purchase Plan (our "ESPP"), in each case, as of December 31, 2016, 5,067,935 shares of common stock that are either subject to outstanding awards, outstanding but subject to vesting, or reserved for future issuance under our 2003 Plan, 2014 Plan, Inducement Plan or ESPP will become eligible for sale in the public market to the extent permitted by the provisions of various vesting schedules. We have filed registration statements permitting shares of common stock issued in the future pursuant to the 2003 Plan, 2014 Plan, Inducement Plan or ESPP to be freely resold by plan participants in the public market and, for shares held by directors, executive officers and other affiliates, subject to compliance with Rule 144. The 2014 Plan and ESPP also contain a provision for the annual increase of the number of shares reserved for issuance under such plan, which shares we also intend to register in the future as such annual increases occurs. If the shares we may issue from time to time under the 2003 Plan, 2014 Plan, the Inducement Plan or ESPP are sold, or if it is perceived that they will be sold, by the award recipient in the public market, the trading price of our common stock could decline.

As of March 1, 2017, certain holders of 1,746,461 shares of our common stock and warrants exercisable for 17,514 shares of our common stock are entitled to rights with respect to the registration of their shares under the Securities Act. Registration of these shares under the Securities Act would result in the shares becoming freely tradable without restriction under the Securities Act, except for shares purchased by affiliates. Sales of such shares could also cause the trading price of our common stock to decline.

Provisions of our charter documents or Delaware law could delay or prevent an acquisition of our company, even if the acquisition would be beneficial to our stockholders, and could make it more difficult for you to change management.

Provisions in our certificate of incorporation and our bylaws may discourage, delay or prevent a merger, acquisition or other change in control that stockholders may consider favorable, including transactions in which stockholders might otherwise receive a premium for their shares. In addition, these provisions may frustrate or

prevent any attempt by our stockholders to replace or remove our current management by making it more difficult to replace or remove our board of directors. These provisions include:

- a classified board of directors so that not all directors are elected at one time;
- a prohibition on stockholder action through written consent;
- no cumulative voting in the election of directors;
- the exclusive right of our board of directors to elect a director to fill a vacancy created by the expansion of the board of directors or the resignation, death or removal of a director;
- a requirement that special meetings of stockholders be called only by the board of directors, the chairman of the board of directors, the chief executive officer or, in the absence of a chief executive officer, the president;
- an advance notice requirement for stockholder proposals and nominations;
- directors may not be removed without cause and may only be removed with cause by the affirmative vote of 66 2/3% of all outstanding shares of our capital stock with the power to vote in the election of directors;
- the authority of our board of directors to issue preferred stock with such terms as our board of directors may determine; and
- a requirement of approval of not less than 66 2/3% of all outstanding shares of our capital stock with the power to vote to amend any bylaws by stockholder action, or to amend specific provisions of our certificate of incorporation.

In addition, Delaware law prohibits a publicly held Delaware corporation from engaging in a business combination with an interested stockholder, generally a person who, together with its affiliates, owns or within the last three years has owned 15% or more of our voting stock, for a period of three years after the date of the transaction in which the person became an interested stockholder, unless the business combination is approved in a prescribed manner. Accordingly, Delaware law may discourage, delay or prevent a change in control of our company. Furthermore, our amended and restated certificate of incorporation will specify that the Court of Chancery of the State of Delaware will be the sole and exclusive forum for most legal actions involving actions brought against us by stockholders. We believe this provision benefits us by providing increased consistency in the application of Delaware law by chancellors particularly experienced in resolving corporate disputes, efficient administration of cases on a more expedited schedule relative to other forums and protection against the burdens of multi-forum litigation. However, the provision may have the effect of discouraging lawsuits against our directors and officers. The enforceability of similar choice of forum provisions in other companies' certificates of incorporation has been challenged in legal proceedings, and it is possible that, in connection with any applicable action brought against us, a court could find the choice of forum provisions contained in our amended and restated certificate of incorporation to be inapplicable or unenforceable in such action.

Provisions in our charter and other provisions of Delaware law could limit the price that investors are willing to pay in the future for shares of our common stock.

We do not anticipate paying any cash dividends on our capital stock in the foreseeable future; as a result, capital appreciation, if any, of our common stock will be your sole source of gain for the foreseeable future.

We have never declared or paid cash dividends on our capital stock. We do not anticipate paying any cash dividends on our capital stock in the foreseeable future. We currently intend to retain all available funds and any future earnings to fund the development and growth of our business. In addition, the terms of any future debt financing arrangement may contain terms prohibiting or limiting the amount of dividends that may be declared or paid on our common stock. As a result, capital appreciation, if any, of our common stock will be your sole source of gain for the foreseeable future.

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 will depend, in part, on the research and reports that securities or industry analysts publish about us or our business. 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.

Item 1B. Unresolved Staff Comments.

None.

Item 2. Properties.

We lease our principal facilities, which consist of approximately 16,000 square feet of office, research and laboratory space located in South San Francisco, California. The leases covering this space expire on April 14, 2017, with options to further extend the lease for an additional three years.

In May 2015, we entered into an office lease agreement for approximately 6,000 square feet in South San Francisco, California through August 31, 2017.

In August 2016, we entered into an office lease agreement for approximately 47,000 square feet in South San Francisco, California, set to commence by the end of March 2017.

Item 3. Legal Proceedings.

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

Item 4. Mine Safety Disclosures.

Not applicable.

Part II

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

Our common stock has been listed on The NASDAQ Global Market under the symbol "AKAO" since March 12, 2014. Prior to that date, there was no public trading market for our common stock. The following table details the high and low intraday sales prices for our common stock for the periods indicated as reported by The NASDAQ Global Market for AKAO.

	Price Range	
Fiscal year ended December 31, 2016	High	Low
1st Quarter	$5.95	$2.59
2nd Quarter	$6.08	$2.60
3rd Quarter	$5.22	$3.36
4th Quarter	$16.20	$3.68
Fiscal year ended December 31, 2015		
1st Quarter	$14.05	$9.00
2nd Quarter	$8.79	$5.30
3rd Quarter	$7.74	$5.43
4th Quarter	$6.50	$5.22

On March 13, 2017, the last trading day prior to March 14, 2017, the closing price for our common stock as reported by The NASDAQ Global Market was $26.79.

Performance Graph

This graph is not "soliciting material," is not deemed "filed" with the SEC and is not to be incorporated by reference into any filing of Achaogen, Inc. under the Securities Act or the Exchange Act, whether made before or after the date hereof and irrespective of any general incorporation language in any such filing.

The graph below matches Achaogen, Inc.'s cumulative 33-Month total stockholder return on common stock with the cumulative total returns of the NASDAQ Composite index and the NASDAQ Biotechnology index. The graph shows the performance of a $100 investment in our common stock and in each index (with the reinvestment of all dividends) at market close on March 12, 2014 (the first day of trading of our common stock) through December 31, 2016. Pursuant to applicable Securities and Exchange Commission rules, all values assume reinvestment of the full amount of all dividends, however no dividends have been declared on our common stock to date. Historical stockholder return is not necessarily indicative of the performance to be expected for any future periods and we do not make or endorse any predictions as to future stockholder returns.

	Ticker	March 12, 2014	December 31, 2014	December 31, 2015	December 31, 2016
Achaogen, Inc.	AKAO	$ 100	$ 91	$ 40	$ 91
Nasdaq Composite Index	IXIC	$ 100	$ 111	$ 118	$ 129
Nasdaq Biotechnology Index	NBI	$ 100	$ 117	$ 130	$ 103

Holders of Common Stock

As of March 1, 2017, there were approximately 18 holders of record of our common stock. This number does not include beneficial owners whose shares are held by nominees in street name.

Dividend Policy

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

Recent Sales of Unregistered Securities

From January 1, 2016 through December 31, 2016, other than as indicated in the paragraph below, we have not issued any securities in a transaction not registered under the Securities Act that have not been previously disclosed in a Quarterly report on Form 10-Q or Current Report on Form 8-K.

In December 2016, we issued 296,148 shares of common stock pursuant to the net exercise of warrants to purchase 392,927 shares of common stock to 2 accredited investors at an exercise price per share of $3.66. We did not receive any cash proceeds from such cashless net exercise.

In December 2016, we issued 314,342 shares of common stock pursuant to the exercise of warrants to purchase 314,342 shares of common stock to 2 accredited investors at an exercise price per share of $3.66. The aggregate cash consideration received for these issuances was approximately $1.2 million.

No underwriters were involved in the foregoing sales of securities. The issuances described above were undertaken in reliance upon the exemption from registration requirements of Section 4(a)(2) of the Securities Act of 1933, as amended, including Rule 506 of the Securities Act. The recipients of these shares of common stock represented their intentions to acquire the shares for investment only and not with a view to or for sale in connection with any distribution, and appropriate restrictions were set out in the applicable agreements issued in these transactions. All recipients had adequate access, through their relationships with us, to information about us.

Use of Proceeds

On March 17, 2014, we closed our IPO and issued 6,900,000 shares of our common stock at an initial offering price of $12.00 per share. The offer and sale of all of the shares in the IPO were registered under the Securities Act pursuant to a registration statement on Form S-1 (File No. 333-193559), which was declared effective by the SEC on March 11, 2014, and a registration statement on Form S-1 (File No. 333-194494), which was effective immediately upon filing on March 11, 2014. No additional shares were registered. The joint book-running managers for the IPO were Credit Suisse Securities (USA) LLC and Cowen and Company, LLC. The aggregate offering price to the public for the shares sold in the IPO was $82.8 million. We received net proceeds from the IPO of approximately $73.9 million, after deducting underwriting discounts and commissions of approximately $5.8 million and expenses of approximately $3.1 million payable by us. None of the expenses associated with the IPO were paid to directors, officers, persons owning 10% or more of any class of equity securities, or to their associates, or to our affiliates.

In June 2014, we repaid our loans with Oxford and Silicon Valley Bank. None of such payments were direct or indirect payments to any of our directors or officers or their associates, to persons owning 10% or more of our capital stock, or to any of our affiliates.

Other than as described above, there have been no material changes in the planned use of proceeds from our IPO as described in the Prospectus.

Issuer Purchases of Equity Securities

Not applicable.

Item 6. Selected Financial Data.

You should read the following selected consolidated financial data together with the section of this report entitled "Management's Discussion and Analysis of Financial Condition and Results of Operations" and our consolidated financial statements and the related notes included in this report. The selected consolidated statement of operations data for the years ended December 31, 2016, 2015 and 2014 and the selected consolidated balance sheet data as of December 31, 2016 and 2015 are derived from our audited consolidated financial statements included elsewhere in this Annual Report on Form 10-K. The selected consolidated statement of operations data for the year ended December 31, 2013 and 2012 and the selected consolidated balance sheet data as of December 31, 2014, 2013 and 2012 are derived from our audited consolidated financial statements not included in this Annual Report on Form 10-K. Our historical results are not necessarily indicative of the results that may be expected in the future and interim results are not necessarily indicative of results to be expected for the full year.

	Year Ended December 31,				
	2016	2015	2014	2013	2012
	(in thousands, except share and per share data)				
Consolidated Statement of Operations Data:					
Revenue:					
Contract revenue	$41,773	$26,061	$19,970	$18,512	$17,941
Operating expenses:					
Research and development	73,999	40,228	30,110	23,484	26,581
General and administrative	17,122	12,406	9,646	6,992	7,349
Total operating expenses	91,121	52,634	39,756	30,476	33,930
Loss from operations	(49,348)	(26,573)	(19,786)	(11,964)	(15,989)
Interest expense	(2,320)	(699)	(397)	(1,331)	(2,427)
Change in warrant and derivative liabilities	(19,859)	(19)	—	—	—
Other income, net	300	198	7	183	51
Net loss	$(71,227)	$(27,093)	$(20,176)	$(13,112)	$(18,365)
Net loss per share—basic and diluted	$(3.00)	$(1.49)	$(1.42)	$(33.83)	$(52.77)
Shares used to compute net loss per share—basic and diluted	23,707,063	18,147,986	14,210,098	387,547	347,993

	As of December 31,				
	2016	2015	2014	2013	2012
	(in thousands)				
Consolidated Balance Sheet Data:					
Cash, cash equivalents and short-term investments	$145,876	$58,731	$63,679	$10,738	$7,073
Working capital (deficit)	140,635	56,800	63,917	8,852	(306)
Total assets	163,925	66,863	70,322	20,758	13,266
Notes and loan payable	25,277	14,536	—	6,687	10,847
Convertible preferred stock	—	—	—	132,278	100,354
Accumulated deficit	(247,220)	(175,993)	(148,900)	(128,724)	(115,612)
Total stockholders' equity (deficit)	106,735	43,159	64,613	(124,576)	(112,578)

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

You should read the following discussion and analysis of our financial condition and results of operations together with the section of this report entitled "Selected Financial Data" and our consolidated financial statements and related notes included elsewhere in this Annual Report on Form 10-K. This discussion and other parts of this report contain forward-looking statements that involve risk and uncertainties, such as statements of our plans, objectives, expectations, and intentions. As a result of many factors, including those factors set forth in the "Risk Factors" section of this Annual Report on Form 10-K, our actual results could differ materially from the results described in or implied by these forward-looking statements.

Overview

We are a late-stage biopharmaceutical company passionately committed to the discovery, development, and commercialization of novel antibacterial treatments against multi-drug resistant ("MDR") gram-negative infections. We are researching and developing plazomicin, our lead product candidate, for the treatment of serious bacterial infections, including complicated urinary tract infection ("cUTI"), blood stream infections and other infections due to MDR Enterobacteriaceae, including carbapenem-resistant Enterobacteriaceae ("CRE"). In 2013, the Centers for Disease Control and Prevention identified CRE as a "nightmare bacteria" and an immediate public health threat that requires "urgent and aggressive action."

On December 12, 2016, we announced positive data from our two Phase 3 clinical trials for plazomicin. The first study, a Phase 3 trial of plazomicin for the treatment of patients with cUTI and acute pyelonephritis ("AP"), entitled EPIC (Evaluating Plazomicin In cUTI), is expected to serve as a single pivotal study supporting a new drug application ("NDA") for plazomicin in the United States. The Phase 3 EPIC trial is a randomized, double blind, active controlled study in patients with cUTI and AP and allowed broad enrollment of patients with gram-negative infections. We reached agreement with the U.S. Food and Drug Administration ("FDA") that this trial, with a 15% non-inferiority margin, comparing plazomicin to meropenem is acceptable as the single study required for potential approval. The first patient was enrolled in the Phase 3 EPIC trial in January 2016 and enrollment was closed in August 2016 with 609 patients.

In the EPIC trial, plazomicin successfully met or exceeded the objective of non-inferiority compared to meropenem for the FDA-specified primary efficacy endpoints, and achieved superiority for the primary efficacy endpoints specified by the European Medicines Agency ("EMA"). Results for the FDA pre-specified composite endpoint of clinical cure and microbiological eradication in the microbiological modified intent-to-treat ("mMITT") population at Day 5 achieved statistical non-inferiority, and Test-of-Cure (Day ~17) achieved statistical superiority. Results for EMA-specified endpoints of microbiological eradication at the test-of-cure visit achieved statistical superiority in both the mMITT and microbiologically evaluable ("ME") populations. Plazomicin was generally well tolerated with no new safety concerns identified in the EPIC trial.

The second study, our Phase 3 CARE (Combating Antibiotic Resistant Enterobacteriaceae) trial was a resistant pathogen trial designed to evaluate the efficacy and safety of plazomicin in patients with serious bacterial infections due to CRE. We closed enrollment in the CARE study in August 2016 with 69 patients, comprised of 39 patients enrolled in Cohort 1, comparing plazomicin to colistin-based therapy in patients with bloodstream infections or pneumonia due to CRE, and 30 patients in Cohort 2, a single arm cohort of plazomicin treatment in patients with serious infections due to CRE. In Cohort 1 of the CARE trial, a lower rate of mortality or serious disease-related complications was observed for plazomicin compared with colistin therapy. The safety profile of plazomicin was favorable to that of colistin in critically ill patients in the CARE trial.

We plan to submit an NDA, which will include data from both the EPIC and CARE Phase 3 clinical trials, to the FDA in the second half of 2017, with a planned commercial launch of plazomicin in the United States in 2018, if our NDA is approved. We also plan to submit a Marketing Authorization Application to the EMA for plazomicin in 2018. In addition, we plan to publicly present detailed results from both the EPIC and CARE trials in mid-2017.

In 2012, the FDA granted fast-track designation for the development and regulatory review of plazomicin to treat serious and life-threatening CRE infections. In 2014, plazomicin received Qualified Infectious Disease Product ("QIDP") designation from the FDA. The QIDP designation was created by the Generating Antibiotic Incentives Now Act (the "GAIN Act"), which was part of the FDA Safety and Innovation Act and provides certain incentives for the development of new antibiotics, including eligibility for priority review and of the NDA extension by an

additional five years of any existing market exclusivity the product may be granted upon approval. Our plazomicin program has been funded in part with a contract from the Biomedical Advanced Research and Development Authority ("BARDA") for up to $123.8 million and as of December 31, 2016, $7.2 million remained available from the funding currently committed under the BARDA contract. We have global commercialization rights to plazomicin, which has patent protection in the United States extending through at least 2031.

Since commencing operations in 2004, we have devoted substantially all of our resources to identifying and developing our product candidates, including conducting preclinical studies and clinical trials and providing general and administrative support for these functions. In addition to plazomicin, our research team is focused on discovering medicines with novel mechanisms of action for serious infections caused by gram-negative bacteria, including MDR Escherichia coli, MDR Klebsiella pneumoniae, MDR Pseudomonas aeruginosa and MDR Acinetobacter baumannii. We recently announced our orally-available antibacterial candidate, C-Scape, a combination of an approved -lactam and an approved -lactamase inhibitor. We also have a program to discover and develop small molecule inhibitors of LpxC (an enzyme essential for the synthesis of the outer membrane of gram-negative bacteria), which is currently on track to file an investigational new drug application ("IND") as early as 2018. Our therapeutic antibody program is utilizing a built-for-purpose discovery platform to identify and develop monoclonal antibodies for the treatment of MDR bacterial infections. We are also pursuing small molecule research and development programs targeting other essential gram-negative enzymes. We are taking a multifaceted approach to identify new antibacterial agents through our research. In May 2016, we entered into a collaboration and license agreement with Crystal Biosciences, Inc. to identify and generate therapeutic antibodies against multiple novel targets. Our goal is to file an IND from our research programs in 2017.

Since our inception, we have financed our operations with the proceeds from our initial public offering ("IPO") of common stock, proceeds from our underwritten public offering of common stock, proceeds from sales of our common stock through our at-the-market ("ATM") equity offering program, funding under our contracts with government agencies, private placements of our equity securities and certain debt-related financing arrangements. Currently, our plazomicin program is funded in part with a contract from BARDA. Our other programs are currently funded primarily with company funds, although we also received a contract for $4.4 million in 2015 from the National Institute of Allergy and Infectious Diseases ("NIAID"), with additional funding of up to $0.6 million available if all options are exercised. Historically, our preclinical programs have received funding support from organizations in addition to the NIH, such as the U.S. Department of Defense and The Wellcome Trust, a global charitable foundation. We intend to continue to seek further collaborations with government agencies, non-profit foundations, and other research and development funding organizations to support our discovery efforts and advance the product candidates in our pipeline.

On March 17, 2014, we completed our IPO of common stock. We sold 6,900,000 shares of our common stock, which included 900,000 shares issued as a result of the underwriters exercising their over-allotment option in full. We received cash proceeds of approximately $73.9 million from the IPO, net of underwriting commissions and related expenses.

On April 7, 2015, we entered into the Sales Agreement (the "Sales Agreement") with Cowen and Company, LLC ("Cowen"), pursuant to which we may issue and sell shares of our common stock having aggregate sales proceeds of up to $30.0 million from time to time through an ATM equity offering program under which Cowen acts as sales agent. As of December 31, 2016, we had sold 1,105,549 shares under the Sales Agreement at an average price of $4.82 per share and we received aggregate cash proceeds of $5.1 million, after deducting the sales commissions and offering expenses.

On August 5, 2015, we entered into a loan and security agreement with Solar Capital Ltd., pursuant to which Solar Capital Ltd. agreed to make available to us term loans with an aggregate principal amount of up to $25.0 million,

$15.0 million of which was provided to us on August 5, 2015 and $10.0 million of which was provided to us on June 20, 2016.

On May 26, 2016, BARDA exercised an additional option ("Option 3") under its existing contract, and we were awarded an additional $20.0 million in contract funding. Option 3 also includes a no-cost extension of the period of performance for Option 1 to September 20, 2016, under the contract to support our Phase 3 EPIC trial of plazomicin. The funding from Option 3 is focused on the Phase 3 pivotal clinical trial of plazomicin, the EPIC study, in cUTI. This brings the total committed funding under the contract to $123.8 million.

On June 3, 2016, we sold 7,999,996 shares of common stock and warrants to purchase 1,999,999 shares of common stock pursuant to a Securities Purchase Agreement (“Purchase Agreement”) for aggregate gross proceeds of $25.4 million and aggregate net proceeds of $25.1 million, after deducting the issuance costs, in a private placement financing transaction (the "Private Placement"). The warrants have an exercise price of $3.66 and are exercisable up to five years from the date of issuance.

On December 19, 2016, we completed an underwritten public offering of common stock, which resulted in the sale of 7,475,000 shares, at a price of $13.50 per share to the public, including the full exercise of the underwriter’s option to purchase an additional 975,000 shares of common stock. We received net proceeds from the offering of $94.6 million, after deducting the underwriting discounts and commissions and estimated offering expenses.

We have never been profitable and have incurred net losses in each year since the commencement of our operations. Substantially all of our net losses have resulted from costs incurred in connection with our research and development programs and associated general and administrative costs. We expect to incur substantial losses from operations in the foreseeable future as we advance plazomicin and other product candidates through preclinical and clinical development, seek regulatory approval, and prepare for, if approved, commercialization. Management expects that, based on its current operating plans, our existing cash, cash equivalents and short-term investments as of December 31, 2016, combined with the committed funds from the BARDA and NIAID contracts, will enable us to fund our current planned operations for at least the next twelve months. We will be required to obtain further funding through public or private equity offerings, debt financings, collaboration and licensing arrangements or other sources to fund the commercial launch of plazomicin. Adequate additional financing may not be available to us on acceptable terms, or at all. Our failure to raise capital as and when needed would have a negative impact on our financial condition and our ability to pursue our business strategy.

We have no manufacturing facilities and all of our manufacturing activities are contracted out to third parties. Additionally, we currently utilize third-party clinical research organizations (“CROs”) to carry out our clinical development and we do not yet have an established sales organization. We will need substantial additional funding to support our operating activities and adequate funding may not be available to us on acceptable terms, or at all.

Critical Accounting Policies and Use of Estimates

Our management’s discussion and analysis of our financial condition and results of operations is based on our consolidated financial statements, which have been prepared in accordance with generally accepted accounting principles in the United States. The preparation of these financial statements requires us to make estimates and assumptions that affect the reported amounts of assets and liabilities at the date of the consolidated financial statements, as well as the reported expenses incurred during the respective 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 most critical to understanding our historical and future performance, as these policies relate to the more significant areas involving management’s judgments and estimates.

Revenue Recognition

We recognize revenue when: (i) evidence of an arrangement exists, (ii) fees are fixed or determinable, (iii) services have been delivered, and (iv) collectability is reasonably assured. We currently generate revenue solely from funding pursuant to government contracts. Our government contracts provide us with payments for certain types of expenditures in return for research and development activities over a contractually defined period. Revenue from these

government contracts are recognized in the period during which the related costs are incurred and the related services are rendered, provided that the applicable conditions under the government contracts have been met.

Funds received from third parties under contract arrangements are recorded as revenue if we are deemed to be the principal participant in the contract arrangements because the activities under the contracts are part of our development programs. If we are not the principal participant, the funds from contracts are recorded as a reduction to research and development expense. Contracts funds received are not refundable and are recognized when the related qualified research and development costs are incurred and when there is reasonable assurance that the funds will be received. Funds received in advance are recorded as deferred revenue. Management has determined that we

are the principal participant under our government contract arrangements, and accordingly, we record amounts earned under the arrangements as revenue.

Research and Development Costs

Research and development costs are expensed as incurred. Research and development expenses include certain payroll and personnel expenses, laboratory supplies, consulting costs, external contract research and development expenses, and allocated overhead, including rent, equipment depreciation, and utilities and relate to both programs sponsored by us as well as costs incurred pursuant to collaboration agreements and government contracts. Nonrefundable advance payments for goods or services that will be used or rendered for future research and development activities on our behalf are deferred and expensed as the goods are delivered or the related services are performed.

For certain research and development services where we have not yet been invoiced or otherwise notified of actual cost from the third-party contracted service providers, we are required to estimate the extent of the services that have been performed on our behalf and the associated costs incurred at each reporting period. The majority of our service providers invoice us monthly in arrears for services performed. We make estimates of our accrued expenses as of each balance sheet date in our consolidated financial statements based on facts and circumstances known to us at that time. We periodically confirm the accuracy of our estimates with the service providers and make adjustments if necessary. Examples of estimated accrued research and development expenses include services from:

- CROs and other service providers in connection with clinical studies;
- contract manufacturers in connection with the production of clinical trial materials; and
- vendors in connection with preclinical development activities.

We base our expenses related to preclinical studies and 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 such studies and trials on our behalf. The financial terms of these agreements are subject to negotiation, vary from contract to contract, and may result in uneven payment flows and expense recognition. 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 these services will be performed and the level of effort to be expended and costs to be incurred during each reporting period. If the actual timing of the performance of services or the level of effort varies from our estimate, we adjust the accrual accordingly. Our estimation of the status and timing of services performed relative to the actual status and timing of services performed may vary and may result in our reporting changes in estimates in any particular period. To date, there have been no material adjustments from our estimates to the amount actually incurred.

Stock-Based Compensation

Stock-based compensation expense for all stock-based compensation awards is based on the grant date fair value. Grant date fair value of time based stock options is estimated using the Black-Scholes option pricing model (“Black-Scholes”) and the Monte-Carlo simulation model for stock options with a market condition. The grant date fair value of restricted stock units is based on the closing price of our stock on the date of grant. We have limited historical information available to support the underlying estimates of certain assumptions required to value stock options. The expected term of options is estimated based on the simplified method. We do not have sufficient trading history to solely rely on the volatility of our own common stock for establishing expected volatility. Therefore, we based our expected volatility on the historical stock volatilities of our common stock as well as several comparable publicly listed companies over a period equal to the expected term of the options. The risk-free interest rate is based on the U.S. Treasury yield curve in effect at the time of grant for the expected term of the stock option. We estimate our forfeiture rate based on an analysis of our actual forfeitures and will continue to evaluate the adequacy of the forfeiture rate based on actual forfeiture experience, analysis of employee turnover behavior and other factors. The

impact from a forfeiture rate adjustment will be recognized in full in the period of adjustment, and if the actual number of future forfeitures differs from that estimated, we may be required to record adjustments to stock-based compensation expense in future periods. We recognize compensation expense on a straight-line basis over the requisite service period.

The assumptions used in calculating the fair value of share-based payment awards represent management's best estimates, but these estimates involve inherent uncertainties and the application of management judgment. As a result, if factors change and we use different assumptions, our stock-based compensation expense could be materially different in the future. In addition, if our actual forfeiture rate is materially different from our estimate, the stock-based compensation expense could be significantly different from what we have recorded in the current period.

Common Stock Valuations

Prior to our IPO, we were required to periodically estimate the fair value of our common stock when issuing stock options and computing our estimated stock-based compensation expense. The fair value of our common stock was determined on a periodic basis by our board of directors, with the assistance of an independent third-party valuation expert. The assumptions underlying these valuations represented management's best estimates, which involved inherent uncertainties and the application of significant levels of management judgment. As a result, if factors or expected outcomes change and we use significantly different assumptions or estimates, our stock-based compensation could be materially different. In determining the fair value of our common stock, our board of directors considered valuation methods intended to comply with Section 409A of the Internal Revenue Code that create a presumption that the resulting valuation is reasonable for federal tax purposes.

The fair value of the common stock underlying our stock options was estimated at each grant date by our board of directors. Our board of directors intended all options granted to be exercisable at a price per share not less than the estimated per share fair value of our common stock underlying those options on the date of grant. The valuations of our common stock were determined in accordance with the guidelines outlined in the American Institute of Certified Public Accountants Practice Aid, Valuation of Privately-Held-Company Equity Securities Issued as Compensation.

Income Taxes

We are subject to income tax in the United States. We use the asset and liability method of accounting for income taxes in which deferred tax assets and liabilities are recognized for the future tax consequences attributable to differences between the consolidated financial statement carrying amounts of existing assets and liabilities and their respective tax bases. Deferred tax assets and liabilities are measured using enacted tax rates expected to apply to taxable income in the years in which those temporary differences are expected to be reversed. The effect on deferred tax assets and liabilities of a change in tax rates is recognized as income in the period that includes the enactment date. A valuation allowance is established if it is more likely than not that all or a portion of the deferred tax asset will not be realized.

Our tax positions are subject to income tax audits by multiple tax jurisdictions. We recognize the tax benefit of an uncertain tax position only if it is more likely than not that the position is sustainable upon examination by the taxing authority, based on the technical merits. The tax benefit recognized is measured as the largest amount of benefit which is more likely than not (greater than 50% likely) to be realized upon settlement with the taxing authority. We recognize interest and penalties accrued on any unrecognized tax benefits as a component of income tax expense.

We calculate the current and deferred income tax provision based on estimates and assumptions that could differ from the actual results reflected in income tax returns filed in subsequent years. Adjustments based on our filed income tax returns are recorded when identified. The amount of income taxes paid is subject to examination by U.S. federal and state tax authorities. The estimate of the potential outcome of any uncertain tax issue is subject to management's assessment of relevant risks, facts, and circumstances existing at that time. To the extent the assessment of such tax position changes, the change in estimate is recorded in the period in which the determination is made.

Warrant Liability

We have warrants outstanding to purchase shares of common stock. The fair value of the warrants is classified as a liability on our consolidated balance sheets as the warrants contain certain material terms which require us to settle the warrants, in a case of certain change of control transactions, for cash equal to the estimated fair value, determined by the Black-Scholes.

The initial fair value of the warrants was determined using a calibration model that involved using Black-Scholes, which requires inputs such as the risk-free interest rate, expected share price volatility, underlying price per share of our common stock and remaining term of the warrants. The warrants are subject to remeasurement at each balance sheet date, using Black-Scholes, with any changes in the fair value of the outstanding warrants included in “change in warrant and derivative liabilities” in the condensed consolidated statements of operations.

Financial Overview and Results of Operations

General

We have not generated net income from operations and, at December 31, 2016, we had an accumulated deficit of $247.2 million, primarily as a result of research and development and general and administrative expenses. While we may in the future generate revenue from a variety of sources, including product sales, license fees, milestone payments and research and development payments in connection with strategic partnerships, our current revenue is generated solely from research and development funding pursuant to government contracts. Our product candidates are still in clinical and preclinical development and may never be successfully developed or commercialized. Other than this contract revenue from government funding, we do not expect to derive any revenue from any product candidates that we develop until we obtain regulatory approval and commercialize such products, which we do not expect will occur before 2018, if at all, or until such time that we potentially enter into collaboration agreements with third parties for the development and commercialization of such product candidates. Accordingly, we expect to continue to incur substantial losses from operations for the foreseeable future, and there can be no assurance that we will ever generate significant revenue or profits.

Contract Revenue

Our contract revenue represents services performed for the development of our product candidates under government contracts. For the years ended December 31, 2016, 2015 and 2014, contract revenue was $41.8 million, $26.1 million and $20.0 million, respectively. We have derived all of our revenue to date from funding provided under U.S. government contracts in connection with the development of our product candidates.

BARDA

We have received funding for our lead product candidate, plazomicin, under a contract with BARDA, an agency of the U.S. Department of Health and Human Services for the development, manufacturing, nonclinical and clinical evaluation of, and regulatory filings for, plazomicin as a countermeasure for disease caused by antibiotic-resistant pathogens and biothreats. Our BARDA contract (the “BARDA Contract”) provides for payments to us based on direct costs incurred and allowances for overhead, plus a fee, where applicable. The total committed funding under our BARDA contract is $123.8 million, including $20.0 million for Option 3, exercised by BARDA on May 26, 2016. The exercised Option 3 funding relates to the support of our Phase 3 EPIC study and the preparation and submission of an NDA to the FDA.

For the years ended December 31, 2016, 2015 and 2014, total revenue recognized under the BARDA Contract was $39.5 million, $17.6 million, and $20.0 million, respectively, of which $11.7 million and $4.7 million were included in contracts receivable at December 31, 2016 and 2015, respectively. Through December 31, 2016, a total of $116.6 million under the BARDA Contract has been recorded as revenue, with $7.2 million remaining available from funding committed under the contract.

NIAID

In July 2014, we were awarded a one-year, $0.4 million grant by NIAID to conduct discovery research on novel antibiotics targeting gram-negative bacteria. The contract was subsequently modified to extend through July 31, 2016.

In July 2015, we were awarded a contract by NIAID for $1.5 million through June 30, 2016, with total funding of up to $4.5 million available if all options are exercised under the contract. In January 2016, an additional committed funding of $0.5 million was added to the awarded funding and the total potential funding was increased to $5.0 million. In April 2016, NIAID modified the contract to exercise an option which increased the total contract

committed funding to $4.4 million through February 2018, with total potential funding remaining at $5.0 million if the remaining option is exercised.

For the years ended December 31, 2016, 2015 and 2014, we recognized revenue under the NIAID Contracts of $2.3 million, $1.4 million and zero, respectively, of which $0.5 million and $0.4 million were included in contracts receivable at December 31, 2016 and 2015, respectively.

Defense Threat Reduction Agency ("DTRA")

In November 2012, the DTRA, a division of the U.S. Department of Defense, terminated for convenience a contract with us to develop novel antibacterials for the treatment of biodefense pathogens. In connection with the termination, we sought payment for additional expenses we had incurred. Effective April 30, 2015, we reached a settlement of our claim with DTRA. The net settlement of $7.1 million, together with sums previously received, constitutes complete and final settlement of the contract.

For the year ended December 31, 2016, 2015 and 2014, we recognized revenue under the DTRA Contract of zero, $7.1 million and zero.

Research and Development Expenses

For the years ended December 31, 2016, 2015 and 2014, research and development expenses were $74.0 million, $40.2 million and $30.1 million, respectively. Research and development ("R&D") expenses consist primarily of costs associated with research, discovery and preclinical studies of potential new drug compounds, plus product development efforts related to clinical trials and materials manufacturing processes. R&D costs are expensed as incurred and include the following:

- expenses incurred under agreements with CROs, investigative sites, and consultants that conduct our clinical trials and a substantial portion of our preclinical activities;
- employee and consultant-related expenses, which include salaries, benefits, stock-based compensation and consulting fees;
- third-party supplier expenses including the cost of acquiring and manufacturing clinical trial and other materials; and
- facilities, depreciation and other allocated expenses, which include direct and allocated expenses for rent and maintenance of facilities, amortization or depreciation of leasehold improvements, equipment and laboratory supplies and other expenses.

Advance payments for goods or services that will be used or rendered for future R&D activities are capitalized as prepaid expenses and recognized as an expense as the goods are delivered or the related services are performed.

We expect to continue to incur substantial expenses for the foreseeable future related to our R&D activities as we continue research programs and the development of our product candidates. Further, we expect to continue to incur substantial R&D expenses in the future as we continue to support plazomicin development, including preparations to submit an NDA for plazomicin to the FDA.

General and Administrative Expenses

General and administrative expenses consist principally of personnel-related costs, professional fees for legal, consulting, finance, audit and tax services, IT software, projects and services, commercialization activities, rent and other general operating expenses not otherwise included in research and development. For the years ended December 31, 2016, 2015 and 2014, general and administrative expenses were $17.1 million, $12.4 million and $9.6 million, respectively. We anticipate general and administrative expenses will continue to increase in future periods,

reflecting an expanding infrastructure in preparation for commercialization of plazomicin, if approved.

Comparison of Years Ended December 31, 2016 and 2015

	Year Ended December 31,		
	2016	2015	Change
	(in thousands)		
Contract revenue	$41,773	$26,061	$15,712
Operating expenses:			
Research and development	73,999	40,228	33,771
General and administrative	17,122	12,406	4,716
Loss from operations	(49,348)	(26,573)	(22,775)
Interest expense	(2,320)	(699)	(1,621)
Change in warrant and derivative liabilities	(19,859)	(19)	(19,840)
Other income, net	300	198	102
Net loss	$(71,227)	$(27,093)	$(44,134)

Contract Revenue

Contract revenue in each period related solely to funding pursuant to our government contracts. Contract revenue increased $15.7 million to $41.8 million for the year ended December 31, 2016 from $26.1 million for the year ended December 31, 2015. This increase was primarily due to an increase in research and development services performed under our BARDA and NIAID contracts, partially offset by a $7.1 million settlement of our claim with DTRA related to our research contract in 2015.

Research and Development Expenses

Research and development ("R&D") expenses increased $33.8 million to $74.0 million for the year ended December 31, 2016 from $40.2 million for the comparable period in 2015. This was primarily due to increases of $20.4 million in the external expenses related to our plazomicin program, mainly attributable to the Phase 3 EPIC trial of plazomicin, $5.9 million in consulting and non-clinical costs for research programs other than plazomicin, including $2.2 million for license fees under a collaboration and license agreement for our early research program, and $7.5 million in personnel and overhead related costs as headcount increased in our research and development organization since 2015.

We record R&D expenses by program where directly identifiable. In the table below, we have allocated indirect R&D costs based on time charged directly to programs by R&D employees. Indirect R&D costs include employee benefit expenses, employee time not charged directly to a program, laboratory supplies and expenses, and allocated facility expenses.

The following table illustrates the components of our research and development expenses during the periods indicated:

	Year Ended December 31,		
	2016	2015	Change
	(in thousands)		
Research and development expenses by program:			
Plazomicin program	$57,818	$30,905	$26,913
Other research programs	16,181	9,323	6,858
Total research and development expenses	$73,999	$40,228	$33,771

General and Administrative Expenses

General and administrative expenses increased $4.7 million to $17.1 million for the year ended December 31, 2016 from $12.4 million for the comparable period in 2015. The increase in general and administrative expenses was primarily due to an increase of $2.6 million in personnel and facility related costs, an increase of $0.5 million in consulting and professional fees, and an increase of $1.6 million in costs to support plazomicin development and manufacture, and to prepare for registration and commercialization.

Interest Expense

Interest expense increased $1.6 million to $2.3 million for the year ended December 31, 2016 from $0.7 million for the year ended December 31, 2015. The increase was a result of the full year effect of borrowing and the additional $10.0 million of borrowings under the Solar Capital loan agreement in June 2016.

Change in Warrant and Derivative Liabilities

Change in warrant and derivative liabilities increased $19.8 million for the year ended December 31, 2016 from zero for the year ended December 31, 2015. The increase is primarily due to the change in the estimated fair value of the warrant liability, which increased mainly due to the increase in our common stock price.

Comparison of Years Ended December 31, 2015 and 2014

	Year Ended December 31,		
	2015	2014	Change
	(in thousands)		
Contract revenue	$26,061	$19,970	$6,091
Operating expenses:			
Research and development	40,228	30,110	10,118
General and administrative	12,406	9,646	2,760
Loss from operations	(26,573)	(19,786)	(6,787)
Interest expense	(699)	(397)	(302)
Change in warrant and derivative liabilities	(19)	—	(19)
Other income, net	198	7	191
Net loss	$(27,093)	$(20,176)	$(6,917)

Contract Revenue

Contract revenue in each period related solely to funding pursuant to our government contracts. Contract revenue increased $6.1 million to $26.1 million for the year ended December 31, 2015 from $20.0 million for the year ended December 31, 2014. The increase was due to a $7.1 million settlement of our claim with DTRA related to our research contract, and $1.4 million from the NIAID contract awarded in 2015, partially offset by a $2.4 million decrease in contract revenue primarily attributable to a decrease in research and development services performed under our BARDA contract.

Research and Development Expenses

Research and development expenses increased $10.1 million to $40.2 million for the year ended December 31, 2015 from $30.1 million for the comparable period in 2014. This was primarily due to increases of $8.1 million in external expenses related to our Phase 3 EPIC trial of plazomicin, $3.4 million in personnel and overhead related costs as net headcount increased by 13 employees in our research and development organization since 2014, $2.2 million in consulting and nonclinical costs for research programs other than plazomicin, partially offset by a decrease of $4.0 million milestone license fee expense to Ionis following dosing the first patient in our Phase 3 CARE trial of plazomicin in 2014.

We record R&D expenses by program where directly identifiable. In the table below, we have allocated indirect R&D costs based on time charged directly to programs by R&D employees. Indirect R&D costs include employee benefit expenses, employee time not charged directly to a program, laboratory supplies and expenses, and allocated facility

expenses.

The following table illustrates the components of our research and development expenses during the periods indicated:

	Year Ended December 31,		
	2015	2014	Change
	(in thousands)		
Research and development expenses by program:			
Plazomicin program	$30,905	$24,114	$6,791
Other research programs	9,323	5,996	3,327
Total research and development expenses	$40,228	$30,110	$10,118

General and Administrative Expenses

General and administrative expenses increased $2.8 million to $12.4 million for the year ended December 31, 2015 from $9.6 million for the comparable period in 2014. The increase in general and administrative expenses was due to increases of $1.5 million in personnel-related costs as net headcount increased by five employees in our general and administrative organization since 2014, $0.8 million in business consulting and professional fees and $0.4 million in costs associated with directors and officers liability insurance and facility-related costs.

Interest Expense

Interest expense increased $0.3 million to $0.7 million from $0.4 million for the years ended December 31, 2015 and 2014, respectively. The increase was primarily a result of interest expense incurred on $15.0 million of borrowings in August 2015.

Liquidity and Capital Resources

Since our inception, we have financed our operations with the proceeds from our IPO of our common stock, proceeds from the underwritten public offering of our common stock, proceeds from sales of our common stock through the use of our ATM equity offering program, funding under our contracts with U.S. government agencies, private placements of our equity securities and certain debt related financing arrangements. In addition, we have historically received funding provided under U.S. government contracts in connection with the development of our product candidates.

We have received funding for our lead product candidate, plazomicin, under a contract with BARDA for the development, manufacturing, nonclinical and clinical evaluation of, and regulatory filings for, plazomicin as a countermeasure for disease caused by antibiotic-resistant pathogens and biothreats. In April 2013, we were awarded an additional $60.4 million under the BARDA contract to support our Phase 3 CARE trial of plazomicin. In May 2016, we were awarded an additional $20.0 million from Option 3 of the BARDA Contract to support the Phase 3 EPIC trial of plazomicin, which includes a no-cost extension of the period of performance for Option 1 to September 20, 2016. This brings the total committed funding under the contract to $123.8 million.

On March 17, 2014, we completed our IPO of common stock. We sold 6,900,000 shares of our common stock, which included 900,000 shares issued as a result of the underwriters exercising their over-allotment option in full. We received cash proceeds of approximately $73.9 million from the IPO, net of underwriting commissions and related expenses.

On August 5, 2015, we entered into a loan and security agreement with Solar Capital Ltd., pursuant to which Solar Capital Ltd. agreed to make available to us term loans with an aggregate principal amount of up to $25.0 million, $15.0 million of which was provided to us on August 5, 2015 and $10.0 million of which was provided to us on June 20, 2016. In addition, we are permitted to make interest-only payments through August 2017, followed by 24 equal

monthly payments of principal plus interest through the scheduled maturity date of August 2019.

On April 7, 2015, we filed a Registration Statement on Form S-3 (File No. 333-203282), declared effective by the Securities and Exchange Commission on April 21, 2015 (the "Shelf Registration Statement"), covering the offering of up to $150 million of common stock, preferred stock, debt securities, warrants, purchase contracts and units. The Shelf Registration Statement included a prospectus covering the offering, issuance and sale of up to $30.0 million of shares of our common stock from time to time in "at the market" offerings pursuant to a Common Stock Sales Agreement entered into with Cowen and Company, LLC (the "Sales Agreement") on April 7, 2015. Through

December 31, 2016, we sold 1,105,549 shares of common stock under the Sales Agreement, at a weighted-average price of approximately $4.82 per share for aggregate gross proceeds of $5.3 million and net proceeds of $5.1 million, after deducting the sales commissions and offering expenses. As of December 31, 2016, approximately $24.7 million of common stock remains available to be sold under the Sales Agreement, subject to certain conditions specified therein.

On June 3, 2016, we sold 7,999,996 shares of common stock and warrants to purchase 1,999,999 shares of common stock pursuant to a Securities Purchase Agreement (“Purchase Agreement”) for aggregate gross proceeds of $25.4 million and aggregate net proceeds of $25.1 million, after deducting the issuance costs, in a private placement financing transaction (the "Private Placement"). The warrants have an exercise price of $3.66 and are exercisable up to five years from the date of issuance.

On December 19, 2016, we completed an underwritten public offering of common stock made under a prospectus supplement and related prospectus pursuant to the Shelf Registration Statement. This offering resulted in the sale of 7,475,000 shares, at a price of $13.50 per share to the public, including the full exercise of the underwriter’s option to purchase an additional 975,000 shares of common stock. We received net proceeds from the offering of $94.6 million, after deducting the underwriting discounts and commissions and estimated offering expenses. As of December 31, 2016, approximately $43.8 million in securities remained unissued under the Shelf Registration Statement.

At December 31, 2016, we had working capital of $140.6 million and unrestricted cash, cash equivalents and short-term investments of $145.9 million.

Plan of Operations and Future Funding Requirements

We expect to incur substantial expenditures in the foreseeable future for research, development and potential commercialization of our product candidates. Specifically, we have incurred and we expect to continue to incur substantial expenses in connection with our clinical development of plazomicin. Management expects that, based on its current operating plans, our existing cash, cash equivalents and short-term investments as of December 31, 2016, combined with the committed funds from the BARDA and NIAID contracts, will enable us to fund our current planned operations for at least the next twelve months from the issuance date of this report.

We anticipate that we will need to raise substantial additional financing in the future to fund our operations, including enabling us to commercially launch plazomicin. We may obtain additional financing through public or private equity offerings, debt financings, a credit facility, government contracts and/or strategic collaborations. Additional financing may not be available to us when we need it or it may not be available to us on acceptable terms, if at all. Our ability to obtain debt financing may be limited by covenants we have made under our loan and security agreement with Solar Capital Ltd. and our pledge to Solar Capital Ltd. of substantially all of our assets, other than our intellectual property, as collateral. The negative pledge in favor of Solar Capital Ltd. with respect to our intellectual property under the loan and security agreement could further limit our ability to obtain additional debt financing. Our failure to raise capital as and when needed could have a negative impact on our financial condition and our ability to pursue our business strategies.

The amount and timing of our future financing requirements will depend on many factors, including:

- the size, timing and type of the nonclinical and clinical studies that we decide to pursue in the development of our product candidates, including plazomicin;
- the type, number, costs and results of the product candidate development programs which we are pursuing or may choose to pursue in the future;

- the rate of progress and cost of clinical trials we may commence, preclinical studies and other discovery and research and development activities;
- the costs associated with developing a plazomicin IVD assay to support therapeutic drug monitoring;
- the timing of, and costs involved in, seeking and obtaining FDA and other regulatory approvals, including the preparation of a NDA for plazomicin, and any supplemental applications thereto;

- our ability to enter into additional collaboration, licensing or other arrangements and the terms and timing of such arrangements;
- the costs of preparing, filing, prosecuting, maintaining and enforcing any patent claims and other intellectual property rights, including litigation costs and the results of such litigation;
- the emergence of competing technologies and other adverse market developments;
- the resources we devote to marketing, and, if approved, commercializing our product candidates;
- the scope, progress, expansion, and costs of manufacturing our product candidates;
- our ability to enter into additional government contracts, or other collaborative agreements, to support the development of our product candidates and development efforts; and
- the costs associated with being a public company.

Cash Flows

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

	Year Ended December 31,		
	2016	2015	2014
	(in thousands)		
Net cash provided by (used in):			
Operating activities	$(46,903)	$(21,088)	$(14,283)
Investing activities	10,368	5,232	(45,427)
Financing activities	135,462	17,262	67,853
Net increase in cash, cash equivalents and restricted cash	$98,927	$1,406	$8,143

Operating Activities

Net cash used in operating activities was $46.9 million, $21.1 million and $14.3 million for the years ended December 31, 2016, 2015 and 2014, respectively. The primary use of cash in these periods was to fund our operations related to the development of our product candidates.

The primary use of cash was to fund our operations related to the research and development of our product candidates. Our net loss from operations in the year ended December 31, 2016 of $71.2 million was partially offset by non-cash charges of $19.9 million for the change of the warrant and derivative liabilities, $0.4 million for depreciation and amortization, $0.3 million for amortization of premium on short-term investments, $0.7 million for non-cash interest expense, $3.8 million for stock-based compensation, and a change in net operating assets and liabilities of $0.9 million. The change in net operating assets and liabilities was primarily due to an increase in in contract receivable, prepaid expenses and other assets and other liabilities partially offset by an increase in accounts payable and accrued liabilities, as a result of costs for our ongoing Phase 3 EPIC trial and the timing of our payments.

Cash used for the year ended December 31, 2015 is primarily comprised of our net loss of $27.1 million, partially offset by non-cash charges for stock-based compensation expense, depreciation and amortization expense, amortization of premium on short-term investments and non-cash interest expense of $4.2 million and a net change in operating assets and liabilities of $1.8 million.

Cash used for the year ended December 31, 2014 is primarily comprised of our net loss of $20.2 million, partially offset by non-cash charges for stock-based compensation expense, depreciation and amortization expense, amortization of premium on short-term investments and non-cash interest expense of $2.9 million and a net change in operating assets and liabilities of $3.0 million.

Investing Activities

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Net cash provided by investing activities was $10.4 million for the year ended December 31, 2016 and consisted primarily of maturities of short-term investments of $42.2 million, partially offset by purchases of short-term securities of $31.0 million and purchases of property and equipment of $0.9 million.

Net cash provided by investing activities was $5.2 million for the year ended December 31, 2015 and consisted primarily of maturities of short-term investments of $47.7 million, partially offset by purchases of short-term investments of $41.8 million and purchases of property and equipment of $0.6 million.

Net cash used in investing activities was $45.4 million for the year ended December 31, 2014 and consisted of purchases of short-term investments of $45.1 million and purchases of property and equipment of $0.3 million.

Financing Activities

Net cash provided by financing activities was $135.5 million for the year ended December 31, 2016. The net cash provided by financing activities during the year ended December 31, 2016 includes $94.9 million of net proceeds, after deducting the underwriting discounts and commissions, from an underwritten public offering of our common stock in December 2016, $25.1 million for the sale of common stock and warrants to purchase common stock from the Private Placement in June 2016, $10.0 million from the term loan provided by Solar Capital Ltd. in June 2016, $3.8 million through ATM offerings in which Cowen and Company, LLC acted as sales agent, $1.2 million of proceeds from the exercise of certain warrants issued from the Private Placement, and $0.5 million from issuance of common stock pursuant to our equity incentive plans.

Net cash provided by financing activities amounted to $17.3 million for the year ended December 31, 2015. The net cash provided by financing activities in 2015 consisted primarily of net proceeds from borrowings of $14.6 million, the issuance of common stock pursuant to incentive plans of $1.4 million and the sale of common stock of $1.3 million through ATM equity offerings in which Cowen and Company, LLC acted as sales agent.

Net cash provided by financing activities amounted to $67.9 million for the year ended December 31, 2014. The net cash provided by financing activities in 2014 consisted primarily of $73.9 million of net proceeds from our initial public offering of our common stock and $0.8 million of proceeds from issuance of common stock pursuant to our equity incentive plans, partially offset by repayment of our notes payable to Oxford Finance LLC and Silicon Valley Bank of $6.9 million.

Contractual Obligations and Commitments

The following table summarizes our contractual obligations as of December 31, 2016 (in thousands):

	Payments due by period				
Contractual Obligations [1]	Total	Less than 1 year	1 to 3 years	4 to 5 years	After 5 years
	(in thousands)				
Long-term debt obligations [2]	27,000	4,167	22,833	-	-
Contract manufacturing obligations [3]	3,782	3,629	40	113	-
Purchase obligations [4]	1,367	1,159	204	4,000	-
Lease obligations [5]	32,299	1,103	5,390	6,089	19,717
Total	64,448	10,058	28,467	6,206	19,717

(1) Pursuant to the Loan and Security Agreement with Solar Capital, we entered into a Success Fee Agreement with the Solar Capital under which we agreed to pay the Solar Capital $1.0 million (the “Success Fee”) if we obtain FDA

approval to market plazomicin. If such approval is obtained, the Success Fee shall be due the later of (i) August 5, 2019 or (ii) the date such FDA approval is obtained, provided such approval is obtained prior to August 5, 2025. This potential payment has been excluded from the table above due to the uncertainty of the occurrence and/or timing of such approval.

(2) The long-term debt obligation is comprised of a Loan and Security Agreement that was executed in August 2015.

(3) These amounts are comprised of contractual obligations related to manufacturing of our drug supply for our product candidates for use in our clinical trials and NDA submission.

(4) These amounts are comprised of commitments to expand our infrastructure to support our growth into a commercial organization.

(5) These amounts are comprised of the estimated remaining rent payments on our existing lease agreements.

Loan and Security Agreement & Success Fee Agreement

On August 5, 2015, we entered into a loan and security agreement (the “Loan Agreement”) with Solar Capital Ltd. (the “Lender”) pursuant to which the Lender agreed to make available to us term loans in an aggregate principal amount of up to $25.0 million with a maturity date of August 5, 2019. An initial $15.0 million term loan was funded at closing on August 5, 2015, and a second $10.0 million term loan was funded on June 20, 2016. Borrowings under the term loans bear interest per annum at 6.99% plus the greater of 1% or the one-month LIBOR. We are currently required to make interest-only payments on the term loans through August 2017, and beginning on September 1, 2017 we are required to make monthly payments of interest plus equal monthly payments of principal over a term of 24 months. The Loan Agreement requires collateral by a security interest in all of our assets except intellectual property (which is subject to a negative pledge) and contains customary affirmative and negative covenants, and also includes standard events of default, including payment defaults. Upon the occurrence of an event of default, a default interest rate of an additional 4% may be applied to the outstanding loan balances, and the Lender may declare all outstanding obligations immediately due and payable and take such other actions as set forth in the Loan Agreement. There were no financial covenants attached to the loan. The Loan Agreement included a closing fee of $250,000 which was paid at closing, and we are obligated to pay a fee equal to 8% of the term loans funded upon the earliest to occur of the maturity date, the acceleration of the term loans or the voluntary prepayment of the term loans. The cost of these fees is being amortized as interest expense over the term of the loan using the effective-interest method. We may voluntarily prepay all, but not less than all, of the outstanding term loans. The Loan Agreement contains customary representations, warranties and covenants. In addition, the Loan Agreement contains customary events of default that entitle the Lender to cause our indebtedness under the Loan Agreement to become immediately due and payable.

On August 5, 2015, pursuant to the Loan Agreement, we entered into a Success Fee Agreement with the Lender under which we agreed to pay the Lender $1.0 million if we obtain FDA approval to market plazomicin. If such approval is obtained, the Success Fee shall be due the later of (i) August 5, 2019 or (ii) the date such FDA approval is obtained. The fair value of the Success Fee at the date of issuance of approximately $356,000 was recorded as a debt discount and is being amortized as interest expense over the term of the loan using the effective-interest method.

Lease Obligations

We lease our principal executive offices in South San Francisco under a non-cancelable lease agreement that expires on April 14, 2017. In August 2016, we entered into a non-cancelable agreement (the "Lease") to lease approximately 47,000 square feet of office, laboratory and research and development space for our new principal executive offices. The Lease is expected to commence in March 2017, after the substantial completion of certain improvements ("Tenant Improvements") required under the Lease, and set to expire in August 2027 ("Lease Term"). The Lease contains expansion options and an option to extend the Lease Term for an additional 5 years. Base rent for the first year of the Lease Term is approximately $2.7 million, with an increase in annual base rent of approximately 3.5% in each subsequent year of the Lease Term. The Lease also provides for rent abatement of approximately $1.8 million for the first year of the Lease Term.

We are entitled to a one-time improvement allowance of $5.7 million for the Tenant Improvements (the "Allowance"). The Landlord disburses the Allowance for the Tenant Improvement on behalf of us. In the event that we withdraw from the Lease prior to the commencement of the Lease, we will be required to reimburse the Landlord for expenditures incurred related to the Tenant Improvements. As of December 31, 2016, we have recorded approximately $1.9 million within construction-in-progress under property, plant and equipment, net and deferred rent in the consolidated balance sheet related to costs incurred under the Allowance. At our election, we are also entitled to an additional improvements allowance of $0.9 million ("Additional Allowance"). In the event that we elect to use the Additional Allowance, the base rent will be increased as calculated in the Lease. Further, we had a

deposit of $250,000 included in long-term restricted cash as of December 31, 2016, restricted from withdrawal and held in a money market account with one of our financial institutions in the form of collateral for a letter of credit held as security for the Lease.

Other Commitments

We have obligations to make future payments to third parties under license agreements, including sublicense fees, royalties, and payments that become due and payable on the achievement of certain development, regulatory and commercialization milestones. However, because the achievement of these milestones is not fixed and determinable, such commitments have not been included on our balance sheet or in the Contractual Obligations and Commitments table above.

Indemnification

In the normal course of business, we enter into contracts and agreements that contain a variety of representations and warranties and provide for general indemnifications. Our exposure under these agreements is unknown because it involves claims that may be made against us in the future, but have not yet been made. To date, we have not paid any claims or been required to defend any action related to our indemnification obligations. However, we may record charges in the future as a result of these indemnification obligations.

In accordance with our amended and restated certificate of incorporation and our amended and restated bylaws, we have indemnification obligations to our officers and directors for specified events or occurrences, subject to some limits, while they are serving at our request in such capacities. We have also entered into indemnification agreements with our directors and executive officers. There have been no claims to date, and we have director and officer insurance that may enable us to recover a portion of any amounts paid for future potential claims.

Off-Balance Sheet Arrangements

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

Recent Accounting Pronouncements

In August 2014, the FASB issued ASU No. 2014-15, Disclosure of Uncertainties about an Entity's Ability to Continue as a Going Concern (Topic 205-40), Going Concern. This ASU introduces an explicit requirement for management to assess if there is substantial doubt about an entity's ability to continue as a going concern, and to provide related footnote disclosures in certain circumstances. In connection with each annual and interim period, management must assess if there is substantial doubt about an entity's ability to continue as a going concern within one year after the issuance date. Disclosures are required if conditions give rise to substantial doubt. We adopted ASU 2014-15 for the year ended December 31, 2016. The adoption did not impact our consolidated financial statements.

In November 2015, the FASB issued ASU No. 2015-17, Income Taxes (Topic 740) - Balance Sheet Classification of Deferred Taxes. This guidance simplifies the presentation of deferred income taxes in a classified balance sheet to require that deferred tax liabilities and assets be classified as noncurrent and is effective for annual reporting periods, including interim reporting periods, beginning after December 15, 2016, and is applicable to our fiscal year beginning January 1, 2017. Early adoption is permitted. We are currently assessing the potential effects of this ASU on our consolidated financial statements.

In February 2016, the FASB issued ASU No. 2016-02, Leases, which, for operating leases, requires a lessee to recognize a right-of-use asset and a lease liability, initially measured at the present value of the lease payments, in its balance sheet. The standard also requires a lessee to recognize a single lease cost, calculated so that the cost of the lease is allocated over the lease term, on a generally straight-line basis. This ASU will be effective for us in fiscal year 2019. Early adoption is permitted. We are currently assessing the potential effects of this ASU on our consolidated financial statements.

In March 2016, the FASB issued ASU No. 2016-06, Derivatives and Hedging (Topic 815) - Contingent Put and Call Options in Debt Instruments. This ASU clarifies the requirements for assessing whether contingent call

(put) options that can accelerate the payment of principal on debt instruments are clearly and closely related to their debt hosts. An entity performing the assessment under the amendments in this Update is required to assess the embedded call (put) options solely in accordance with the four-step decision sequence. This guidance should be applied on a modified retrospective basis to existing debt instruments as of the beginning of the fiscal year in which the amendments are effective, and is effective for fiscal years beginning after December 15, 2016, including interim periods within those fiscal years. We are currently assessing the potential effects of this ASU on our consolidated financial statements.

In March 2016, the FASB issued ASU No 2016-09, Compensation - Stock Compensation (Topic 718) - Improvements to Employee Share-Based Payment Accounting. This ASU simplifies the accounting for share-based payment transactions, including the income tax consequences, classification of awards as either equity or liabilities, and classification on the statement of cash flows. In addition, the guidance allows for a policy election to account for forfeitures as they occur rather than on an estimated basis. This ASU will be effective for fiscal years beginning after December 15, 2016, and interim periods within those fiscal years. Early adoption is permitted. We are currently assessing the potential effects of this ASU on our consolidated financial statements.

In May 2014, the FASB issued ASU No. 2014-09, Revenue from Contracts with Customers (Topic 606), which provides a single comprehensive model for entities to use in accounting for revenue arising from contracts with customers and will supersede most current revenue recognition guidance. This ASU is based on the principle that revenue is recognized to depict the transfer of 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. This 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. We have not yet finalized our preliminary assessment and conclusions on how the adoption of this ASU will affect our current policies related to revenue recognition. We will adopt the new revenue standard on January 1, 2018, and through the remainder of 2017, will continue to assess the potential impact of adopting this new standard on any current, new or significantly modified customer contracts. In subsequent quarters, we will finalize our selection of transition methods, and complete our evaluation of additional disclosures that may be required upon adoption of the new standard.

In November, 2016, the FASB issued ASU No. 2016-18, Statement of Cash Flows (230): Restricted Cash. This ASU requires that a statement of cash flows explain the change during the period in the total of cash, cash equivalents, and amounts generally described as restricted cash or restricted cash equivalents. Therefore, amounts generally described as restricted cash and restricted cash equivalents should be included with cash and cash equivalents when reconciling the beginning-of-period and end-of-period total amounts shown on the statement of cash flows. This ASU will be effective for fiscal years beginning after December 15, 2017, and interim periods within those fiscal years. Early adoption is permitted. We adopted this ASU for the year-ended December 31, 2016 and the transition disclosure is located in Note 2 of our consolidated financial statements contained in our Annual Report on Form 10-K for the year ended December 31, 2016.

JOBS Act Accounting Election

The Jumpstart our Business Startups Act of 2012 (“JOBS Act”), permits an “emerging growth company” such as us to take advantage of an extended transition period to comply with new or revised accounting standards applicable to public companies. We are choosing to “opt out” of this provision and, as a result, we will comply with new or revised accounting standards as required when they are adopted. This decision to opt out of the extended transition period under the JOBS Act is irrevocable.

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

We are exposed to limited market risk related to fluctuations in interest rates and market prices. Our primary exposure to market risk is interest rate sensitivity, which is affected by changes in the general level of U.S. interest rates. 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, 2016, we had unrestricted cash, cash equivalents and short-term investments of $145.9 million consisting of cash and money market funds deposited in highly rated financial institutions in the United

States and corporate debt securities of institutions with investment grade credit ratings. A portion of our investments may be subject to interest rate risk and could fall in value if market interest rates increase. However, because our investments are primarily short-term in duration, we believe that our exposure to interest rate risk is not significant. We do not enter into investments for trading or speculative purposes and have not used any derivative financial instruments to manage our interest rate risk exposure. We have not been exposed nor do we anticipate being exposed to material risks due to changes in interest rates. Assuming a hypothetical increase in interest rates of one percentage point, the fair value of our total investment portfolio as of December 31, 2016, would have potentially declined by approximately $0.1 million. We actively monitor changes in interest rates.

We contract for the conduct of certain clinical development and manufacturing activities with vendors outside the United States. We are subject to exposure due to fluctuations in foreign exchange rates in connection with these agreements. For the year ended December 31, 2016, a 1% movement in foreign exchange rates would not be material to us.

We do not believe that inflation or fluctuations in foreign exchange rates had a significant impact on our results of operations for any periods presented in our financial statements.

Item 8. Financial Statements and Supplementary Data.

Achaogen, Inc.

Index to Consolidated Financial Statements

Years Ended December 31, 2016, 2015 and 2014

Contents

Report of Independent Registered Public Accounting Firm

The Board of Directors and Stockholders of

Achaogen, Inc.

We have audited the accompanying consolidated balance sheets of Achaogen, Inc. as of December 31, 2016 and 2015, and the related consolidated statements of operations, comprehensive loss, convertible preferred stock and stockholders' equity (deficit) and cash flows for each of the three years in the period ended December 31, 2016. These financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on these financial statements based on our audits.

We conducted our audits in accordance with the standards of the Public Company Accounting Oversight Board (United States). Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement. We were not engaged to perform an audit of the Company's internal control over financial reporting. Our audits included consideration of internal control over financial reporting as a basis for designing audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Company's internal control over financial reporting. Accordingly, we express no such opinion. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements, assessing the accounting principles used and significant estimates made by management, and evaluating the overall financial statement presentation. We believe that our audits provide a reasonable basis for our opinion.

In our opinion, the financial statements referred to above present fairly, in all material respects, the consolidated financial position of Achaogen, Inc. at December 31, 2016 and 2015, and the consolidated results of its operations and its cash flows for each of the three years in the period ended December 31, 2016, in conformity with U.S. generally accepted accounting principles.

/s/ Ernst & Young LLP

Redwood City, California

March 14, 2017

Achaogen, Inc.

Consolidated Balance Sheets

(in thousands except for share and per share amounts)

	December 31, 2016	December 31, 2015
Assets		
Current assets:		
Cash and cash equivalents	$ 118,964	$ 20,287
Short-term investments	26,912	38,444
Contracts receivable	12,151	5,039
Prepaids and other current assets	2,189	1,719
Restricted cash	127	—
Total current assets	160,343	65,489
Property and equipment, net	3,261	905
Restricted cash	250	127
Deposit and other assets	71	342
Total assets	$ 163,925	$ 66,863
Liabilities and Stockholders' Equity		
Current liabilities:		
Accounts payable	$ 5,739	$ 3,537
Accrued liabilities	9,698	4,927
Loan payable, current portion	4,167	—
Other current liabilities	104	225
Total current liabilities	19,708	8,689
Loan payable, long-term	21,110	14,536
Warrant liability	13,874	—
Derivative liability	602	375
Deferred Rent	1,896	104
Total liabilities	57,190	23,704
Commitments and contingencies (Note 7)		
Stockholders' equity:		
Common stock, $0.001 par value, 290,000,000 shares authorized, 35,638,052 and 18,395,219 shares issued and outstanding at December 31, 2016 and 2015, respectively	35	18
Preferred stock, $0.001 par value, 10,000,000 shares authorized, no shares issued and outstanding	—	—
Additional paid-in capital	353,927	219,182
Accumulated deficit	(247,220)	(175,993)
Accumulated other comprehensive loss	(7)	(48)
Total stockholders' equity	106,735	43,159
Total liabilities and stockholders' equity	$ 163,925	$ 66,863

See accompanying notes to consolidated financial statements.

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Achaogen, Inc.

Consolidated Statements of Operations

(in thousands except for share and per share amounts)

	Year Ended December 31,		
	2016	2015	2014
Contract revenue	41,773	26,061	19,970
Operating expenses:			
Research and development	73,999	40,228	30,110
General and administrative	17,122	12,406	9,646
Total operating expenses	91,121	52,634	39,756
Loss from operations	(49,348)	(26,573)	(19,786)
Interest expense	(2,320)	(699)	(397)
Change in warrant and derivative liabilities	(19,859)	(19)	—
Other income, net	300	198	7
Net loss	(71,227)	(27,093)	(20,176)
Basic and diluted net loss per common share	(3.00)	(1.49)	(1.42)
Weighted-average common shares outstanding used to calculate basic and diluted net loss per common share	23,707,063	18,147,986	14,210,098

See accompanying notes to consolidated financial statements.

Achaogen, Inc.

Consolidated Statements of Comprehensive Loss

(in thousands)

	Year Ended December 31,		
	2016	2015	2014
Net loss	$(71,227)	$(27,093)	$(20,176)
Other comprehensive loss:			
Net unrealized gain (loss) on available-for-sale securities	41	(16)	(32)
Total comprehensive loss	$(71,186)	$(27,109)	$(20,208)

See accompanying notes to consolidated financial statements.

Achaogen, Inc.

Consolidated Statements of Convertible Preferred Stock and Stockholders' Equity (Deficit)

(in thousands except for share amounts)

	Convertible Preferred Stock		Common Stock		Additional Paid-In Capital	Accumulated Deficit	Accumulated Other Comprehensive Loss	Total Stockholders' Equity (Deficit)
	Shares	Amount	Shares	Amount				
Balance at December 31, 2013	9,796,342	$132,278	392,844	—	4,148	(128,724)	—	(124,576)
Conversion of preferred stock to common stock upon initial public offering	(9,796,342)	(132,278)	10,386,894	11	132,267	—	—	132,278
Issuance of common stock upon initial public offering, net of issuance costs	—	—	6,900,000	7	73,929	—	—	73,936
Issuance of common stock upon exercise of warrant	—	—	909	—	2	—	—	2
Issuance of common stock under stock plans	—	—	208,693	—	706	—	—	706
Issuance of common stock under ESPP	—	—	17,795	—	139	—	—	139
Reclassification of warrant liability to additional paid-in capital	—	—	—	—	286	—	—	286
Stock-based compensation expense	—	—	—	—	2,050	—	—	2,050
Unrealized loss on available-for-sale securities, net of taxes	—	—	—	—	—	—	(32)	(32)
Net loss	—	—	—	—	—	(20,176)	—	(20,176)
Balance at December 31, 2014	—	—	17,907,135	18	213,527	(148,900)	(32)	64,613
Issuance of common stock under "at-the-market"equity offering sales agreement, less issuance costs	—	—	197,838	—	1,319	—	—	1,319
Issuance of common stock under stock plans	—	—	228,504	—	1,053	—	—	1,053
	—	—	61,742	—	300	—	—	300

Issuance of common stock under ESPP								
Stock-based compensation expense	—	—	—	—	2,983	—	—	2,983
Unrealized loss on available-for-sale securities, net of taxes	—	—	—	—	—	—	(16)	(16)
Net loss	—	—	—	—	—	(27,093)	—	(27,093)
Balance at December 31, 2015	—	—	18,395,219	18	219,182	(175,993)	(48)	43,159
Issuance of common stock under "at-the-market"equity offering sales agreement, less issuance costs	—	—	907,711	1	3,826	—	—	3,827
Issuance of common stock under stock plans	—	—	103,912	—	65	—	—	65
Issuance of common stock under ESPP	—	—	145,724	—	401	—	—	401
Issuance of common stock upon an underwritten public offering, net of issuance costs	—	—	7,475,000	7	94,540	—	—	94,547
Issuance of common stock upon sale of common stock under the private placement, net of issuance costs	—	—	7,999,996	8	22,579	—	—	22,587
Issuance of common stock upon exercise of warrants	—	—	610,490	1	9,487	—	—	9,488
Stock-based compensation expense	—	—	—	—	3,847	—	—	3,847
Unrealized gain on available-for-sale securities, net of taxes	—	—	—	—	—	—	41	41
Net loss	—	—	—	—	—	(71,227)	—	(71,227)
Balance at December 31, 2016	—	—	35,638,052	35	353,927	(247,220)	(7)	106,735

See accompanying notes to consolidated financial statements.

Achaogen, Inc.

Consolidated Statements of Cash Flows

(in thousands)

	Year Ended December 31,		
	2016	2015	2014
Cash flows from operating activities:			
Net loss	$(71,227)	$(27,093)	$(20,176)
Adjustments to reconcile net loss to net cash used in operating activities:			
Depreciation and amortization	441	426	358
Amortization of premium on short-term investments	304	500	257
Stock-based compensation expense	3,847	2,983	2,050
Revaluation of convertible preferred stock warrant	—	—	42
Change in warrant and derivative liabilities	19,859	19	—
Non-cash interest expense relating to notes payable	741	302	209
Change in operating assets and liabilities:			
Contracts receivable	(7,112)	195	1,996
Prepaids and other assets	(199)	(1,504)	1,397
Accounts payable and accrued liabilities	6,668	3,076	(539)
Other liabilities	(225)	8	123
Net cash used in operating activities	(46,903)	(21,088)	(14,283)
Cash flows from investing activities:			
Purchase of property and equipment	(901)	(606)	(340)
Purchase of short-term investments	(30,961)	(41,851)	(45,087)
Maturities of short-term investments	42,230	47,689	—
Net cash provided by (used in) investing activities	10,368	5,232	(45,427)
Cash flows from financing activities:			
Proceeds from initial public offering, net of issuance costs	—	—	73,936
Proceeds from underwritten public offering, net of issuance costs	94,852	—	—
Proceeds from private placement, net of issuance costs	25,166	—	—
Proceeds from sales of common stock, net of issuance costs	3,827	1,319	—
Proceeds from the issuance of common stock in connection with equity incentive plans	466	1,353	811
Proceeds from exercise of stock warrants	1,151	—	2
Proceeds from loan payable, net of issuance costs	10,000	14,590	—
Repayment of notes payable	—	—	(6,896)
Net cash provided by financing activities	135,462	17,262	67,853
Net increase in cash, cash equivalents, and restricted cash	98,927	1,406	8,143
Cash, cash equivalents, and restricted cash at beginning of year	20,414	19,008	10,865
Cash, cash equivalents, and restricted cash at end of year	$119,341	$20,414	$19,008
Supplemental disclosures of cash flow information			
Interest paid	$1,579	$396	$221
Supplemental disclosures of noncash investing and financing information			
Conversion of convertible preferred stock into common stock	$—	$—	$132,278
Reclassification of warrant liability to additional paid-in capital	$8,337	$—	$286
Accrued and deferred public offering issuance cost	$305	$—	$—
Issuance of derivative in connection with issuance of loan payable	$—	$356	$—

Purchases of property plant and equipment included in deferred rent	$1,896

See accompanying notes to consolidated financial statements.

Achaogen, Inc.

Notes to Consolidated Financial Statements

1. Organization and Basis of Presentation and Consolidation

Achaogen, Inc. (together with its consolidated subsidiary, the "Company") is a late-stage biopharmaceutical company passionately committed to the discovery, development, and commercialization of novel antibacterial treatments against multi-drug resistant gram-negative infections. The Company is developing plazomicin, its lead product candidate, for the treatment of bacterial infections due to multi-drug resistant Enterobacteriaceae, including carbapenem-resistant Enterobacteriaceae ("CRE"). The Company's Phase 3 study of plazomicin in the treatment of patients with complicated urinary tract infections ("cUTI") and acute pyelonephritis ("AP"), entitled EPIC (Evaluating Plazomicin In cUTI), is expected to serve as a single pivotal study supporting a new drug application ("NDA") for plazomicin in the United States. In addition, the Company's Phase 3 study of plazomicin, the CARE (Combating Antibiotic Resistant Enterobacteriaceae) trial, which is a resistant pathogen-specific trial designed to evaluate the efficacy and safety of plazomicin in patients with infections due to CRE.

The Company was incorporated in Delaware in 2002 and commenced operations in 2004. Since commencing operations in 2004, the Company has devoted substantially all its resources to identifying and developing its product candidates, including conducting preclinical studies and clinical trials and providing general and administrative support for these operations.

Reclassifications

The change in derivative liability for the year ended December 31, 2015 has been reclassified to be included in the change in warrant and derivative liabilities to conform to the current year's presentation. Such reclassifications did not impact the Company's net loss or financial position.

Basis of Presentation and Consolidation

The consolidated financial statements are prepared in accordance with U.S. generally accepted accounting principles (U.S. GAAP) and include the consolidated accounts of the Company and its subsidiary. Intercompany accounts and transactions have been eliminated in consolidation. During 2012, the Company established a wholly owned foreign subsidiary in the United Kingdom. There have been no significant activities for this entity during the fiscal years ended December 31, 2016, 2015 and 2014.

In March 2014, the Company completed its initial public offering ("IPO") of shares of its common stock, pursuant to which the Company issued 6,900,000 shares of common stock, which includes 900,000 shares issued pursuant to the over-allotment option granted to its underwriters, and received net proceeds of approximately $73.9 million, after deducting underwriting discounts, commissions and offering expenses. In connection with the completion of the Company's IPO, all shares of convertible preferred stock converted into 10,386,894 shares of common stock and all of the Company's convertible preferred stock warrants were converted into warrants to purchase common stock.

On April 7, 2015, the Company filed a Registration Statement on Form S-3, declared effective by the SEC on April 21, 2015, covering the offering of up to $150.0 million of common stock, preferred stock, debt securities, warrants, purchase contracts and/or units. This Registration Statement included a prospectus covering the offering, issuance and sale of up to $30.0 million of shares of the Company's common stock from time to time in an "at-the-market" ("ATM") equity offering pursuant to a sales agreement with Cowen and Company, LLC. As of December 31, 2016, the Company had sold 1,105,549 shares pursuant to its ATM equity offering program at a weighted-average price of

$4.82 per share for aggregate offering proceeds of $5.3 million and aggregate net proceeds of $5.1 million, after deducting the sales commissions and offering expenses.

On June 3, 2016, the Company sold 7,999,996 shares of its common stock and warrants to purchase 1,999,999 shares of its common stock pursuant to Securities Purchase Agreement (the "Purchase Agreement") for aggregate gross proceeds of $25.4 million and aggregate net proceeds of $25.1 million, after deducting the issuance costs, in connection with a private placement financing transaction (the "Private Placement"). The warrants have an exercise price of $3.66 per share and are exercisable up to five years from the date of issuance.

On December 19, 2016, the Company completed an underwritten public offering of common stock made under a prospectus supplement and related prospectus pursuant to the Shelf Registration Statement. This offering resulted in the sale of 7,475,000 shares, at a price of $13.50 per share, including the full exercise of the underwriter's option to purchase an additional 975,000 shares of common stock. The Company received net proceeds from the offering of $94.6 million, after deducting the underwriting discounts and commissions and estimated offering expenses.

The Company has incurred losses and negative cash flows from operations every year since its inception. As of December 31, 2016, the Company had unrestricted cash, cash equivalents and short-term investments of approximately $145.9 million and an accumulated deficit of approximately $247.2 million. Management expects that, based on its current operating plans, the Company's existing cash, cash equivalents and short-term investments as of December 31, 2016, combined with the committed funds from the BARDA and NIAID contracts, will be sufficient to fund its current planned operations for at least the next twelve months from the issuance of this report. Management plans to raise additional funds through equity or debt financing arrangements, government contracts, and/or third party collaboration funding in the future to fund its operations, including the commercial launch of plazomicin. However, there can be no assurance that such funding sources will be available at terms acceptable to the Company or at all. If the Company is unable to raise additional funding to meet its working capital needs, it will be forced to delay or reduce the scope of its research programs and/or limit or cease its operations.

The accompanying financial statements have been prepared assuming that the Company will continue as a going concern, which contemplates the realization of assets and the settlement of liabilities and commitments in the normal course of business. The financial statements do not reflect any adjustments relating to the recoverability and reclassification of assets and liabilities that might be necessary if the Company is unable to continue as a going concern.

2. Summary of Significant Accounting Policies

Use of Estimates

The accompanying financial statements have been prepared in accordance with U.S. GAAP. The preparation of financial statements in conformity with U.S. GAAP requires management to make judgments, assumptions and estimates that affect the reported amounts of assets, liabilities, revenues and expenses and related disclosures of contingent liabilities. On an ongoing basis, management evaluates its estimates, including those related to clinical trial accruals, fair value of derivative and warrant liabilities, common stock and stock-based awards and income taxes. Management bases its estimates on historical experience and on various other assumptions that are believed to be reasonable under the circumstances, the results of which form the basis for making judgments about the carrying values of assets and liabilities that are not readily apparent from other sources. Actual results may differ materially from those estimates.

Fair Value of Financial Instruments

The carrying amounts of the Company's financial instruments, including cash and cash equivalents, contracts receivable, prepaid and other current assets, accounts payable, accrued liabilities, and other current liabilities approximate fair value due to their short-term maturities. Short-term investments consist of available-for-sale securities as of December 31, 2016 and are carried at fair value. Based upon the borrowing rates currently available to the Company for loans with similar terms, the Company believes the carrying amounts of the loan payable and the derivative liability also represent fair values.

Cash and Cash Equivalents

Cash equivalents include only securities having an original maturity of three months or less at the time of purchase. As of December 31, 2016 and 2015, cash and cash equivalents consisted of bank deposits, cash, and investments in money market funds.

Short-term Investments

Short-term investments consist of debt securities with maturities greater than three months, but less than one year from the date of acquisition, and are classified as available for sale. Short-term investments are carried at fair

value. Unrealized gains and losses on available-for-sale securities are excluded from earnings and are reported as a component of net unrealized losses on available-for-sale securities in the Company's consolidated statements of comprehensive loss. The amortized cost of debt securities reflects amortization of purchase premiums and accretion of purchase discounts to date, which is included in interest income.

The Company reviews all of its marketable securities on a regular basis to evaluate whether any security has experienced an other-than-temporary decline in fair value.

Restricted Cash

At December 31, 2016 and December 31, 2015, the Company had restricted cash of $377,000 and $127,000. The following table provides a reconciliation of cash, cash equivalents, and restricted cash reported within the consolidated balance sheet that sum to the total of the same such amounts shown in the consolidated statements of cash flows (in thousands):

	Year Ended December 31,		
	2016	2015	2014
Cash and cash equivalents	$118,964	$20,287	$18,881
Restricted cash, current	127	-	-
Restricted cash, non current	250	127	127
Total cash, cash equivalents, and restricted cash	$119,341	$20,414	$19,008

The restricted cash, which consists of money market accounts with one of the Company’s financial institutions, serves as collateral for the letters of credit provided as security deposits under the Company’s facility leases. As of December 31, 2016, $127,000 of restricted cash is classified as current assets and relates to the current facility lease that expires on April 14, 2017.

Segment Reporting

Operating segments are identified as components of an enterprise about which separate discrete financial information is available for evaluation by the chief operating decision maker in making decisions regarding resource allocation and assessing performance. The Company has one operating segment.

Customer Concentration

For the years ended December 31, 2016, 2015 and 2014, all of the Company’s revenue has been generated solely from funding pursuant to U.S. government contracts, and accordingly all contracts receivable relate to funding from U.S. government contracts.

Concentration of Credit Risk

Financial instruments that potentially subject the Company to a significant concentration of credit risk consist of cash, cash equivalents and short-term investments. Cash and cash equivalents are deposited in checking and money market accounts at one financial institution, which at times, may exceed federally insured limits. Management believes that the financial institution is financially sound, and, accordingly, minimal credit risk exists with respect to this financial institution. The Company’s investment policy limits investments to certain types of debt securities issued by the U.S. government, its agencies and institutions with investment-grade credit ratings and places restrictions on maturities and concentration by type and issuer. The Company is exposed to credit risk in the event of default by the institutions holding its cash and cash equivalents or issuing the debt securities. As of December 31, 2016, the Company has not experienced any credit losses in such accounts or investments.

Contracts Receivable

Contracts receivable represent amounts owed to the Company under certain government contracts. The Company had no amounts reserved for doubtful accounts as of December 31, 2016 and 2015, as the Company expects full collection of the receivable balances.

Property and Equipment, Net

Property and equipment consists of office equipment, laboratory equipment, and leasehold improvements and is stated at cost, less accumulated depreciation and amortization. Depreciation is computed using the straight-line method over the estimated useful lives of the respective assets, generally three to seven years. Leasehold improvements are amortized over their estimated useful lives or the remaining lease term, whichever is shorter. Maintenance and repair costs are recorded as a component of operating expenses in the Company’s consolidated statement of operations when incurred.

Impairment of Long-Lived Assets

The Company reviews long-lived assets, including property and equipment, for impairment whenever events or changes in business circumstances indicate that the carrying amount of the assets may not be fully recoverable. If indicators of impairment exist, an impairment loss would be recognized when the estimated undiscounted future cash flows expected to result from the use of the asset and its eventual disposition are less than its carrying amount. The impairment charge is determined based upon the excess of the carrying value of the asset over its estimated fair value, with estimated fair value determined based upon an estimate of discounted future cash flows or other appropriate measures of estimated fair value. For the years ended December 31, 2016, 2015 and 2014, the Company did not have any impairment charges.

Convertible Preferred Stock Warrant Liabilities

The Company accounted for its Series A and Series C convertible preferred stock warrants as freestanding warrants for shares that are puttable or redeemable. At December 31, 2013, these warrants were classified as liabilities on the consolidated balance sheet at their estimated fair value. At the end of each reporting period, changes in estimated fair value during the period were recorded as a component of other income, net. At the time of the IPO, the warrants to purchase preferred stock were converted into warrants to purchase common stock, which are no longer subject to remeasurement, and the preferred stock warrant liability was reclassified to additional paid-in capital at its then fair value.

Warrant Liability

On June 3, 2016, the Company issued warrants to purchase 1,999,999 shares of its common stock in connection with the Private Placement. Each warrant has an exercise price of $3.66 per share and is exercisable for five years from the date of issuance. The Company accounts for these warrants as a liability instrument measured at estimated fair value. The initial fair value of the warrants was determined using a calibration model that involved using the Black-Scholes Pricing Model ("Black-Scholes"), which requires inputs such as the risk-free interest rate, expected share price volatility, underlying price per share of the Company's common stock and remaining term of the warrants. The warrants are subject to remeasurement at each balance sheet date, using Black-Scholes, with any changes in the fair value of the outstanding warrants recognized in the condensed consolidated statements of operations.

Stock-Based Compensation

The Company measures and recognizes the compensation expense for all stock-based awards made to employees and directors, including employee stock options, stock grants and employee stock purchases related to the Employee Stock Purchase Plan (“ESPP”) based on estimated fair values. The Company uses the Black-Scholes option-pricing valuation model to estimate the grant-date fair value of stock option and ESPP awards with time-based vesting terms. The determination of fair value for stock-based awards on the date of grant using an option-pricing model requires management to make certain assumptions regarding a number of complex and subjective variables. The fair value of

restricted stock unit (“RSU”) awards with time-based vesting terms is based on the grant date share price. The Company recognizes stock-based compensation cost over the award’s requisite service period on a straight-line basis for time-based awards and on a graded basis for awards that are contingent on the achievement of market-based conditions. The Company records stock-based compensation expense, net of the estimated impact of forfeited awards. As such, the Company recognizes stock-based compensation expense only for those stock-based awards that are expected to vest over their requisite service period, based on the vesting provisions of the individual underlying grants.

During 2016 and 2014, the Company issued stock-based option awards with market-based conditions that vest upon achievement of certain market price thresholds of the Company's common stock. The estimated fair value for market-based stock option awards is determined using a lattice valuation model with a Monte-Carlo simulation. The model takes into consideration the historical volatility of the Company's stock and the risk-free interest rate at the date of grant. In addition, the model is used to estimate the derived service period for the awards. The derived service period is the estimated period of time that would be required to satisfy the market condition, assuming the market condition will be satisfied. Stock-based compensation expense is recognized over the implicit service period derived from the Monte-Carlo simulation model, as applicable, but is accelerated if the market condition is achieved earlier than estimated.

For non-employee stock-based awards, the measurement date on which the estimated fair value of the stock-based award is calculated is equal to the earlier of (i) the date at which a commitment for performance by the counterparty to earn the equity instrument is reached or (ii) the date at which the counterparty's performance is complete. The Company recognizes stock-based compensation expense for the estimated fair value of the vested portion of non-employee awards.

Revenue Recognition

The Company recognizes revenue when: (i) evidence of an arrangement exists, (ii) fees are fixed or determinable, (iii) services have been delivered, and (iv) collectability is reasonably assured. The Company currently generates revenue entirely from government contracts. Government contracts provide the Company with payments for certain types of expenditures in return for research and development activities over a contractually defined period. Revenue from government contracts is recognized in the period during which the related costs are incurred and the related services are rendered, provided that the applicable conditions under the government contracts have been met. Costs of contract revenue are recorded as a component of operating expenses in the Company's consolidated statements of operations.

Funds received from third parties under contract arrangements are recorded as revenue if the Company is deemed to be the principal participant in the contract arrangements because the activities under the contracts are part of the Company's development programs. If the Company is not the principal participant, the funds from contracts are recorded as a reduction to research and development expense. Contracts funds received are not refundable and are recognized when the related qualified research and development costs are incurred and when there is reasonable assurance that the funds will be received. Funds received in advance are recorded as deferred revenue. Management has determined that the Company is the principal participant under the Company's government contract arrangements, and accordingly, the Company records amounts earned under the arrangements as revenue.

Research and Development Costs

Research and development costs are expensed as incurred. Research and development expenses include certain payroll and personnel expenses, laboratory supplies, consulting costs, external contract research and development expenses, and allocated overhead, including rent, equipment depreciation, and utilities and relate to both Company-sponsored programs as well as costs incurred pursuant to collaboration agreements and government contracts. Nonrefundable advance payments for goods or services that will be used or rendered for future research and development activities are deferred and recognized as an expense as the goods are delivered or the related services are performed.

For certain research and development services where the Company has not yet been invoiced or otherwise notified of actual cost from the third-party contracted service providers, the Company is required to estimate the extent of the services that have been performed on the Company's behalf and the associated costs incurred at each reporting period. The majority of the service providers invoice the Company monthly in arrears for services performed. The Company make estimates of the accrued expenses as of each balance sheet date in the consolidated financial statements based on facts and circumstances known to the Company at that time. The Company periodically confirm the accuracy of the estimates with the service providers and make adjustments if necessary. Examples of estimated accrued research and development expenses include services from:

•CROs and other service providers in connection with clinical studies;

•contract manufacturers in connection with the production of clinical trial materials; and

•vendors in connection with preclinical development activities.

The Company bases the expenses related to preclinical studies and clinical trials on estimates of the services received and efforts expended pursuant to contracts with multiple research institutions and CROs that conduct and manage such studies and trials on the Company's behalf. The financial terms of these agreements are subject to negotiation, vary from contract to contract, and may result in uneven payment flows and expense recognition. 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, the Company estimates the time period over which these services will be performed and the level of effort to be expended and costs to be incurred during each reporting period. If the actual timing of the performance of services or the level of effort varies from the estimate, the Company adjusts the accrual accordingly. The Company's estimation of the status and timing of services performed relative to the actual status and timing of services performed may vary and may result in reporting changes in estimates in any particular period. To date, there have been no material adjustments from the Company's estimates to the amount actually incurred.

Leases

The Company has entered into lease agreements for its laboratory and office facilities. These leases qualify as and are accounted for as operating leases. Rent expense is recognized on a straight-line basis over the term of the lease and, accordingly, the Company records the difference between cash rent payments and the recognition of rent expense as a deferred rent liability. Incentives granted under the Company's facilities leases, including allowances to fund leasehold improvements and rent holidays, are capitalized and are recognized as reductions to rental expense on a straight-line basis over the term of the lease.

Income Taxes

The Company uses the liability method of accounting for income taxes. Under this method, deferred tax assets and liabilities are determined based on the differences between the financial reporting and the tax bases of assets and

liabilities and are measured using the enacted tax rates and laws that will be in effect when the differences are expected to reverse. The Company must then assess the likelihood that the resulting deferred tax assets will be realized. A valuation allowance is provided when it is more likely than not that some portion or all of a deferred tax asset will not be realized. The Company assesses the need for a valuation allowance against the Company's deferred income tax assets by considering both positive and negative evidence related to whether it is more likely than not that the deferred income tax assets will be realized. In evaluating its ability to recover the deferred income tax assets within the jurisdiction from which they arise, the Company considered all available positive and negative evidence,

including scheduled reversals of deferred income tax liabilities, projected future taxable income, tax-planning strategies, and results of recent operations. Due to the Company's considerations, the net deferred tax assets have been fully offset by a valuation allowance.

The Company recognizes benefits of uncertain tax positions if it is more likely than not that such positions will be sustained upon examination based solely on their technical merits. The tax benefit recognized in the financial statements for a particular tax position is the largest amount of benefit that is more likely than not to be realized upon the ultimate settlement. The Company's policy is to recognize interest and penalties accrued on any unrecognized tax benefits as a component of income tax expense.

Net Loss and Per Share

Basic net loss per common share is computed by dividing the net loss by the weighted-average number of common shares outstanding during the period. Diluted net loss per common share is computed by dividing the net loss by the weighted-average number of common shares and dilutive common share equivalents outstanding during the period. Because the Company has reported a net loss for the years ended December 31, 2016, 2015 and 2014, diluted net loss per common share is the same as basic net loss per common share for those periods.

Effective as of the completion of the IPO, all of the Company's preferred stock was converted to common stock. For purposes of calculating net loss per common share for the year ended December 31, 2014, the preferred stock converted to common stock was included in the net loss per common share calculation on a post-conversion basis based on the conversion date.

The following table sets forth the computation of the basic and diluted net loss per share during the years ended December 31, 2016, 2015 and 2014 (in thousands, except share and per share amounts):

	Year Ended December 31,		
	2016	2015	2014
Net loss	$(71,227)	$(27,093)	$(20,176)
Weighted-average common shares outstanding used to calculate basic and diluted net loss per common share	23,707,063	18,147,986	14,210,098
Basic and diluted net loss per common share	$(3.00)	$(1.49)	$(1.42)

The following potentially dilutive securities outstanding have been excluded from the computations of diluted weighted-average shares outstanding because such securities have an anti-dilutive impact due to losses reported (in common stock equivalent shares):

	December 31,		
	2016	2015	2014
Options to purchase common stock	3,540,293	2,387,337	1,885,372
Restricted stock units	605,052	372,024	168,200
Warrants to purchase common stock	1,322,754	30,024	40,454

Warrants outstanding as of December 31, 2016 have a weighted-average exercise price of $3.85.

Recent Accounting Pronouncements

In August 2014, the Financial Accounting Standards Board ("FASB") issued ASU No. 2014-15, Disclosure of Uncertainties about an Entity's Ability to Continue as a Going Concern (Topic 205-40), Going Concern. This ASU

introduces an explicit requirement for management to assess if there is substantial doubt about an entity's ability to continue as a going concern, and to provide related footnote disclosures in certain circumstances. In connection with each annual and interim period, management must assess if there is substantial doubt about an entity's ability to continue as a going concern within one year after the issuance date. Disclosures are required if conditions give rise to substantial doubt. The Company adopted ASU 2014-15 for the year ended December 31, 2016. The adoption did not impact its consolidated financial statements.

In November 2015, the FASB issued ASU No. 2015-17, Income Taxes (Topic 740) - Balance Sheet Classification of Deferred Taxes. This guidance simplifies the presentation of deferred income taxes in a classified balance sheet to require that deferred tax liabilities and assets be classified as noncurrent and is effective for annual reporting periods, including interim reporting periods, beginning after December 15, 2016, and is applicable to the Company's fiscal year beginning January 1, 2017. Early adoption is permitted. The Company is currently assessing the potential effects of this ASU on its consolidated financial statements.

In February 2016, the FASB issued ASU No. 2016-02, Leases, which, for operating leases, requires a lessee to recognize a right-of-use asset and a lease liability, initially measured at the present value of the lease payments, in its balance sheet. The standard also requires a lessee to recognize a single lease cost, calculated so that the cost of the lease is allocated over the lease term, on a generally straight-line basis. This ASU will be effective for the Company in fiscal year 2019. Early adoption is permitted. The Company is currently assessing the potential effects of this ASU on its consolidated financial statements.

In March 2016, the FASB issued ASU No. 2016-06, Derivatives and Hedging (Topic 815) - Contingent Put and Call Options in Debt Instruments. This ASU clarifies the requirements for assessing whether contingent call (put) options that can accelerate the payment of principal on debt instruments are clearly and closely related to their debt hosts. An entity performing the assessment under the amendments in this Update is required to assess the embedded call (put) options solely in accordance with the four-step decision sequence. This guidance should be applied on a modified retrospective basis to existing debt instruments as of the beginning of the fiscal year in which the amendments are effective, and is effective for fiscal years beginning after December 15, 2016, including interim periods within those fiscal years. The Company is currently assessing the potential effects of this ASU on its consolidated financial statements.

In March 2016, the FASB issued ASU No 2016-09, Compensation - Stock Compensation (Topic 718) - Improvements to Employee Share-Based Payment Accounting. This ASU simplifies the accounting for share-based payment transactions, including the income tax consequences, classification of awards as either equity or liabilities, and classification on the statement of cash flows. In addition, the guidance allows for a policy election to account for forfeitures as they occur rather than on an estimated basis. This ASU will be effective for fiscal years beginning after December 15, 2016, and interim periods within those fiscal years. Early adoption is permitted. The Company is currently assessing the potential effects of this ASU on its consolidated financial statements.

In May 2014, the FASB issued ASU No. 2014-09, Revenue from Contracts with Customers (Topic 606), which provides a single comprehensive model for entities to use in accounting for revenue arising from contracts with customers and will supersede most current revenue recognition guidance. This ASU is based on the principle that revenue is recognized to depict the transfer of 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. This 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. The Company has not yet finalized its preliminary assessment and conclusions on how the adoption of this ASU will affect its current policies related to revenue recognition. The Company will adopt the new revenue standard on January 1, 2018, and through the remainder of 2017, will continue to assess the potential impact of adopting this new standard on any current, new or significantly modified customer contracts. In subsequent quarters, the Company will finalize its selection of transition methods, and complete its evaluation of additional disclosures that may be required upon adoption of the new standard.

In November, 2016, the FASB issued ASU No. 2016-18, Statement of Cash Flows (230): Restricted Cash. This ASU requires that a statement of cash flows explain the change during the period in the total of cash, cash equivalents, and amounts generally described as restricted cash or restricted cash equivalents. Therefore, amounts generally described

as restricted cash and restricted cash equivalents should be included with cash and cash equivalents when reconciling the beginning-of-period and end-of-period total amounts shown on the statement of cash flows. This ASU will be effective for fiscal years beginning after December 15, 2017, and interim periods within those fiscal years. Early adoption is permitted. The Company elected to early adopt this ASU for the year-ended December 31, 2016 and the transition disclosure is located above in Note 2.

3. Fair Value Measurements

Financial assets and liabilities are recorded at fair value. The carrying amount of certain financial instruments, including cash, cash equivalents, contracts receivable, accounts payable, and accrued liabilities, approximate fair value due to their relatively short maturities. Assets and liabilities recorded at fair value on a recurring basis in the consolidated balance sheets are categorized based upon the level of judgment associated with the inputs used to measure their fair values. Fair value is defined as the exchange price that would be received for an asset or an exit price that would be paid to transfer a liability in the principal or most advantageous market for the asset or liability in an orderly transaction between market participants on the measurement date. The authoritative guidance on fair value measurements establishes a three-tier fair value hierarchy for disclosure of fair value measurements as follows:

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

Level 2: Observable inputs other than Level 1 prices, such as quoted prices for similar assets or liabilities, quoted prices in markets that are not active, or other inputs that are observable or can be corroborated by observable market data for substantially the full term of the assets or liabilities.

Level 3: Unobservable inputs that are supported by little or no market activity and that are significant to the fair value of the assets or liabilities.

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

During the periods presented, the Company has not changed the manner in which it values liabilities that are measured at estimated fair value using Level 3 inputs. There were no transfers within the hierarchy during the years ended December 31, 2016 and 2015.

Financial instruments

Financial assets and liabilities measured and recognized at fair value on a recurring basis were as follows (in thousands):

As of December 31, 2016:

	December 31, 2016			
	Amortized Cost	Unrealized Gains	Unrealized Losses	Fair Value
Assets				
Cash	$3,728	$ —	$ —	$3,728
Level 1:				
Restricted cash	377	—	—	377
Money market funds	115,236	—	—	115,236
Subtotal	115,613	—	—	115,613
Level 2:				
Corporate debt securities	12,969	—	(7)	12,962
Commercial paper	13,950	—	—	13,950
Subtotal	26,919	—	(7)	26,912
	$146,260	$ —	$ (7)	$146,253
Reported as:				
Cash and cash equivalents				$118,964
Short-term investments				$26,912
Restricted cash				$377
Liabilities, Level 3				
Warrant Liability				$13,874
Derivative Liability				$602
Total				$14,476

As of December 31, 2015:

	December 31, 2015			
	Amortized Cost	Unrealized Gains	Unrealized Losses	Fair Value
Assets				
Cash	$1,013	$ —	$ —	$ 1,013
Level 1:				
Restricted cash	127	—	—	127
Money market funds	19,274	—	—	19,274
Subtotal	19,401	—	—	19,401
Level 2:				
Corporate debt securities	34,490	—	(47)	34,443
Commercial paper	1,997	—	—	1,997
US Treasury bills	2,005	—	(1)	2,004
Subtotal	38,492	—	(48)	38,444
Total	$58,906	$ —	$ (48)	$ 58,858
Reported as:				
Cash and cash equivalents				$ 20,287
Short-term investments				$ 38,444
Restricted cash				$ 127
Liabilities				
Level 3:				
Derivative liability				$ 375

All available-for-sale securities held as of December 31, 2016 had contractual maturities of less than one year. There were no sales of available-for-sale securities in any of the periods presented. The fair value of corporate and U.S. Treasury debt obligations that were in unrealized loss positions totaled $13.0 million as of December 31, 2016. The Company has determined that (i) it does not have the intent to sell any of these investments, and (ii) it is not more likely than not that it will be required to sell any of these investments before recovery of the entire amortized cost basis. The Company anticipates that it will recover the entire amortized cost basis of such corporate and U.S. Treasury debt obligations and has determined that no other-than-temporary impairments associated with credit losses were required to be recognized during the year ended December 31, 2016.

Pursuant to the loan and security agreement with Solar Capital Ltd. (see Note 8), the Company entered into a Success Fee Agreement under which the Company agreed to pay $1.0 million (the “Success Fee”) if the Company obtains FDA approval to market plazomicin. If such approval is obtained, the Success Fee shall be due the later of (i) August 5, 2019 or (ii) the date such FDA approval is obtained. The fair value of the Success Fee, approximately $375,000 at December 31, 2015, is recorded as a derivative liability and included in other long-term liabilities on the accompanying consolidated balance sheet. The estimated fair value of the derivative liability as of December 31, 2016 increased by $227,000 to $602,000 from December 31, 2015, primarily as a result of an increased probability of FDA approval to market plazomicin, which is presented as a component of change in warrant and derivative liabilities in the Company’s condensed consolidated statements of operations for the year ended December 31, 2016.

The fair value of the derivative liability was determined using a discounted cash flow analysis, and is classified as a Level 3 measurement within the fair value hierarchy since the Company’s valuation utilized significant unobservable inputs. Specifically, the key assumptions included in the calculation of the estimated fair value of the derivative instrument include: i) the Company’s estimates of both the probability and timing of a potential $1.0 million payment to Solar Capital Ltd. upon FDA approval to market plazomicin, and ii) a discount rate of 13% which was derived from

the Company's estimated cost of debt. The estimated fair value of the derivative liability is most sensitive to the probability of FDA approval. Should the probability of FDA approval change by 5%, the fair value of the derivative liability as of December 31, 2016 would change by approximately $36,000. For the year ended December 31, 2016, the only change to the key assumption was an increase in the probability of the potential payment, primarily due to the positive results in the Company’s Phase 3 cUTI and CRE clinical trials of plazomicin. Any changes in the estimated fair values are presented as changes in warrant and derivative liabilities in the Company's condensed consolidated statements of operations.

Pursuant to the Private Placement (see Note 2), the Company issued warrants to purchase 1,999,999 shares of common stock at an exercise price of $3.66 per share. The Company classified these warrants as a liability measured at fair value using Black-Scholes. Under certain entity conditions, the holder of a warrant may require the Company to settle the warrant in cash at its estimated fair value using Black-Scholes. On the closing date of the Private Placement, June 3, 2016, the $2.6 million initial estimated fair value of the warrants was recorded as a warrant liability on the accompanying condensed consolidated balance sheet. At December 31, 2016, the estimated fair value of the warrants was approximately $13.9 million. The change in the estimated fair value is primarily due to the increase in the Company's stock price, partially offset by the exercise of 707,269 warrants, and is included in changes in warrant and derivative liabilities in the Company's condensed consolidated statements of operations.

In December 2016, certain holders of these warrants exercised 707,269 warrants. The Company received $1.2 million in proceeds from these warrant exercises. The Company is required to record the exercised warrants at its estimated fair value at the time of exercise, with any change included in changes in warrant and derivative liabilities in the Company’s condensed consolidated statements of operations. The Company estimated the fair value of these exercised warrants at their respective exercise dates to be $8.3 million, an increase of $7.4 million from its initial valuation, at June 3, 2016, of $0.9 million, primarily due to an increase in the Company’s stock price. In February 2017, certain holders of these warrants exercised 78,585 warrants. The Company received $0.3 million in proceeds from these warrant exercises.

The fair value of the warrant liability is classified as a Level 3 measurement within the fair value hierarchy since the Company’s valuation utilized significant unobservable inputs, including the risk-free interest rate, expected share price volatility, underlying price per share of the Company's common stock and remaining term of the warrants. The estimated fair values of the warrants were determined using Black-Scholes with the following assumptions, during the year ended December 31, 2016:

	Year Ended December 31, 2016
Expected volatility	60% – 80%
Expected term	4.4 – 5.0 years
Risk-free interest rate	1.0% – 1.9%
Dividend yield	0%

The expected volatility is based on the Company's expected volatility. The expected term is based on the remaining life of the warrants. The risk-free interest rate is obtained from the yields on actively traded U.S. Treasury securities for a period equal to the expected term of the warrants. The dividend yield is zero because the Company has never paid cash dividends and has no present intention to pay cash dividends. Should the share price change by 5%, the fair value of the warrant liability as of December 31, 2016 would change by approximately $801,000.

The convertible preferred stock warrant liabilities and derivative liabilities associated with certain convertible loans were considered Level 3 liabilities. The estimated fair values of the outstanding preferred stock warrant liabilities were measured using the Black-Scholes option-pricing model. The estimated fair value of the derivative liability associated with the convertible loan due to beneficial conversion features (“BCF”), on certain of the Company’s convertible loans was measured by multiplying (1) the intrinsic value of the 20% conversion discount on the effective date and (2) the number of shares converted. The fair value of the convertible preferred stock warrant liabilities was estimated to be $244,000 as of December 31, 2013.

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In connection with the completion of the Company's IPO in March 2014, all of the outstanding warrants to purchase convertible preferred stock converted into warrants to purchase 40,454 shares of common stock at a weighted-average exercise price of $12.36 per share. The Company remeasured the estimated fair value of these remaining warrants at the date of the conversion and recorded a $42,000 loss related to the change in estimated fair value as part of other income, net, and reclassified the estimated fair value of $286,000 to additional paid-in capital.

The following table provides a summary of changes in the estimated fair value of the Company's liabilities measured at estimated fair value using significant Level 3 inputs for the years ended 2016, 2015 and 2014 (in thousands):

	Estimated Fair Value of Convertible Preferred Stock Warrant Liabilities	Estimated Fair Value of Derivative Liability	Estimated Fair Value of Warrant Liability
Balance of Level 3 Liabilities at December 31, 2013	$ 244	$ —	$ —
Change in estimated fair value of convertible preferred stock warrant liabilities	42	—	—
Reclassification of warrant liability to additional paid-in-capital upon conversion of warrant to purchase convertible preferred stock to warrant to purchase common stock	(286)	—	—
Balance of Level 3 Liabilities at December 31, 2014	—	—	—
Estimated fair value of derivative liability issued	—	356	—
Change in estimated fair value of derivative liability	—	19	—
Balance of Level 3 Liabilities at December 31, 2015	—	375	—
Estimated fair value of warrants issued	—	—	2,579
Change in estimated fair value of warrant liability	—	—	19,632
Reclassification of warrant liability to additional paid-in-capital upon exercise of warrants			(8,337)
Change in estimated fair value of derivative liability	—	227	—
Balance of Level 3 Liabilities at December 31, 2016	$ —	$ 602	$ 13,874

4. Balance Sheet Components

Property and Equipment, net

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

	December 31,	
	2016	2015
Office equipment	$644	$1,144
Laboratory equipment	4,038	3,161
Leasehold improvements	1,072	1,072
Construction-in-progress	1,896	—
	7,650	5,377
Less: accumulated depreciation and amortization	$(4,389)	(4,472)
Property and equipment, net	$3,261	$905

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Depreciation and amortization expense for the years ended December 31, 2016, 2015 and 2014 was $441,000, $426,000 and $358,000, respectively.

Accrued Liabilities

Accrued liabilities consisted of the following (in thousands):

	December 31,	
	2016	2015
Accrued clinical and development expenses	$3,681	$2,869
Payroll and related bonus expenses	4,941	1,615
Other	1,076	443
	$9,698	$4,927

5. License and Collaboration Agreements

Thermo Fisher Scientific, Inc.

In April 2016, the Company entered into an agreement with its collaboration partner, Thermo Fisher Scientific, Inc. (“Thermo Fisher”), to develop and commercialize an assay to support plazomicin. If approved, the Company and Thermo Fisher plan to have a commercial assay for plazomicin available at launch to enable patients to receive safe and efficacious doses of plazomicin. In accordance with the terms of the agreement, the Company is required to make milestone payments with respect to research, development, regulatory and commercialization milestones (if any). All such milestone payments may total, in aggregate, up to but no more than $6,453,000. In further consideration of this agreement, in the event of a successful commercialization of the assay, the Company is required to pay a minimum threshold annual revenue to Thermo Fisher.

As of December 31, 2016, the Company has incurred $1,204,000 in milestone payments and the cost was fully recorded as research and development expense. In February 2017, the Company announced the achievement of a strategic milestone in this ongoing collaboration.

Crystal Biosciences, Inc.

In May 2016, the Company entered into a collaboration and license agreement with Crystal Biosciences, Inc. (“Crystal”). Pursuant to the terms of this agreement, the Company and Crystal agreed to collaborate on the discovery of monoclonal antibodies against multiple targets. Crystal agreed to conduct the initial discovery work with its antibody platform and the Company has the right to develop and commercialize the antibodies discovered through this collaboration. The Company is required to provide signing and milestone payments with respect to research, development, regulatory and commercialization milestones (if any). All such milestone payments may total, in aggregate, up to but no more than $20,550,000. The upfront signing fee, technology access fees and research funding were recorded as research and development expense during the year ended December 31, 2016. This collaboration and license agreement also provides that the Company shall pay royalties equal to a low single-digit percentage of annual worldwide net sales of the commercialized product.

Ionis Pharmaceuticals

In January 2006, the Company entered into a license agreement with Ionis Pharmaceuticals, Inc. (“Ionis”). Ionis granted the Company an exclusive, worldwide license with the right to grant and authorize sublicenses related to the research

and development of aminoglycoside products. As an up-front fee, the Company issued 97,402 shares of preferred Series A convertible stock at a fair value of $15.40 per share. This license fee of $1,500,000 was recorded as research and development expense in 2006. In further consideration of this license, and in accordance with the terms of the agreement, the Company is required to make milestone payments with respect to development, regulatory and commercialization milestones, and to pay a percentage of revenue received from sublicensees (if any). All such milestone and sublicense revenue payments may total, in the aggregate, up to but no more than $19,500,000 for the first product and $9,750,000 following the second product commercialized under the agreement with Ionis. The Company is also required to pay additional milestone payments of up to $20,000,000 in the

aggregate upon the first achievement of specified threshold levels of annual net sales of all aminoglycoside products in a calendar year. The license agreement also provides that the Company shall pay royalties equal to a low single-digit percentage of annual worldwide net sales of any licensed products, including, if applicable, plazomicin.

In 2014, the Company met its third milestone under the license with Ionis when it dosed the first patients in the Phase 3 CARE trial for plazomicin, and made the milestone payment of $4,000,000, which was recorded as research and development expense. As of December 31, 2016 and 2015, the Company had no outstanding payments due under the agreement.

6. Government Contracts

Certain of the Company’s drug discovery and development activities are performed under contracts with U.S. government agencies. Management has determined that the Company is the principal participant in the following contract arrangements, and, accordingly, the Company records amounts earned under the arrangements as revenue. Costs incurred under revenue contracts are recorded as operating expenses in the Company' consolidated statements of operations.

BARDA

In August 2010, the Company was awarded a contract with BARDA, for the development, manufacturing, nonclinical and clinical evaluation of, and regulatory filings for, plazomicin as a countermeasure for disease caused by antibiotic-resistant pathogens and biothreats. The original contract included committed funding of $27,600,000 for the first two years of the contract and subsequent options exercisable by BARDA to provide additional funding. In September 2012, BARDA modified the contract to increase the total contract committed funding to $43,398,000 through March 2014. In April 2013, the Company was awarded an additional $60,410,000 under the contract to support its Phase 3 CARE clinical trial of plazomicin which increased the total committed funding under this contract to $103,808,000. On May 26, 2016, the Company was awarded an additional $20 million ("Option 3") under the contract to support its Phase 3 EPIC trial of plazomicin. This brings the total committed funding under the contract to $123,808,000. As of December 31, 2016, $7,227,000 was remaining available from funding committed under this contract. During the years ended December 31, 2016, 2015 and 2014, the Company recognized revenue of $39,462,000, $17,569,000 and $19,970,000, respectively, under this agreement, of which $11,668,000 and $4,657,000 were included in contracts receivable at December 31, 2016, and 2015, respectively.

DTRA

In November 2012, DTRA, a division of the U.S. Department of Defense, terminated for convenience a contract with the Company that provided funding for the Company's LpxC inhibitor program. In connection with the termination, the Company sought payment from DTRA for additional expenses the Company has incurred. Effective April 30, 2015, the Company reached a settlement of its claim with DTRA. The net settlement of $7,122,000 was recorded as contract revenue during the year ended December 31, 2015. Together with sums previously received, it constitutes complete and final settlement of the contract.

NIAID

In July 2015, the Company was awarded a contract by NIAID for $1.5 million through June 30, 2016, with total funding up to $4.5 million available if all options are exercised under the contract. In January 2016, an additional committed funding of $0.5 million was added to the awarded funding and the total potential funding was increased to $5.0 million. In April 2016, NIAID modified the contract to exercise an option which increased the total contract committed funding to $4.4 million through February 2018, with total potential funding remaining at $5.0 million if the

remaining option is exercised.

In July 2014, the Company was awarded a one-year, 407,000 grant by NIAID to conduct discovery research on novel antibiotics targeting gram-negative bacteria. In July 2015, NIAID extended this grant term through July 31, 2016. During the years ended December 31, 2016, 2015 and 2014, the Company recognized revenue of $2,311,000, $1,370,000 and zero, respectively, under these agreements, of which $483,000 and $382,000 were included in contracts receivable at December 31, 2016 and 2015, respectively.

7. Commitments

Facility Lease Agreement

The Company leases its principal executive offices in South San Francisco under a non-cancelable lease agreement that expires on April 14, 2017. In August 2016, the Company entered into a non-cancelable agreement (the "Lease") to lease approximately 47,000 square feet of office, laboratory and research and development space for the Company's new principal executive offices. The Lease is expected to commence in March 2017, after the substantial completion of certain improvements ("Tenant Improvements") required under the Lease, and set to expire in August 2027 ("Lease Term"). The Lease contains expansion options and an option to extend the Lease Term for an additional 5 years. Base rent for the first year of the Lease Term is approximately $2.7 million, with an increase in annual base rent of approximately 3.5% in each subsequent year of the Lease Term. The Lease also provides for rent abatement of approximately $1.8 million for the first year of the Lease Term.

The Company is entitled to a one-time improvement allowance of $5.7 million for the Tenant Improvements (the "Allowance"). The Landlord disburses the Allowance for the Tenant Improvement on behalf of the Company. In the event that the Company withdraws from the Lease prior to the commencement of the Lease, the Company will be required to reimburse the Landlord for expenditures incurred related to the Tenant Improvements. As of December 31, 2016, the Company has recorded approximately $1.9 million within construction-in-progress under property, plant and equipment, net and deferred rent in the consolidated balance sheet related to costs incurred under the Allowance. At its election, the Company is also entitled to an additional improvements allowance of $0.9 million ("Additional Allowance"). In the event the Company elects to use the Additional Allowance, the base rent will be increased as calculated in the Lease. Further, the Company had a deposit of $250,000 included in long-term restricted cash as of December 31, 2016, restricted from withdrawal and held in a money market account with one of the Company’s financial institutions in the form of collateral for a letter of credit held as security for the Lease.

Future minimum lease payments under the operating leases as of December 31, 2016 are as follows (in thousands):

Year-ended December 31,	Amounts
2017	$ 1,103
2018	2,500
2019	2,890
2020	2,991
2021	3,098
Thereafter	19,717
Total minimum lease payments	$ 32,299

The Company recognizes rent expense on a straight-line basis over the non-cancelable lease period. Aggregate rent expense, net of sublease income, was $581,000, $526,000 and $405,000 for the years ended December 31, 2016, 2015 and 2014, respectively. The Company received $97,000 of sublease income for the year ended December 31, 2014 and none for the years ended December 31, 2015 and 2016.

Nonrefundable Advance Payments

In July 2015, the Company entered into an agreement with its pharmaceutical contract manufacturing organization that obligates it to make a total of $1,500,000 of nonrefundable advance payments for the reservation of facilities and resources, plus procurement of long lead raw materials, to produce plazomicin for regulatory commercial validation. Such advance payments are initially capitalized as prepaid and other current assets and will be recognized as research and development expenses as goods are delivered and services are performed. The Company assesses such prepaid and other current assets for impairment if events or changes in circumstances indicate that the carrying amount may

not be recoverable or may not provide future economic benefits. As of December 31, 2016, the Company had recorded $660,000 as prepaid and other current assets related to this agreement. Through December 31, 2016, the Company has recognized $840,000 as research and development expenses.

Commercial Validation and Manufacturing Agreement

In March 2017, the Company entered into a commercial validation and manufacturing agreement ("Manufacturing Agreement"). The Manufacturing Agreement includes certain purchase obligations, contingent upon FDA's approval of plazomicin. For further details, refer to Note 14.

Guarantees and Indemnifications

As permitted under Delaware law and in accordance with the Company's bylaws, the Company is required to indemnify its officers and directors for certain events or occurrences while the officer or director is or was serving in such capacity. The Company is also party to indemnification agreements with its directors and officers. The Company believes the fair value of the indemnification rights and agreements is minimal. Accordingly, the Company has not recorded any liabilities for these indemnification rights and agreements as of December 31, 2016 and 2015.

8. Borrowings

Solar Capital Ltd. Loan Agreement

On August 5, 2015, the Company entered into a loan and security agreement (the "Loan Agreement") with Solar Capital Ltd. (the "Lender") pursuant to which the Lender agreed to make available to the Company term loans in an aggregate principal amount of up to $25.0 million with a maturity date of August 5, 2019. An initial $15.0 million term loan was funded at closing on August 5, 2015, and a second $10.0 million term loan was funded on June 20, 2016. Borrowings under the term loans bear interest per annum at 6.99% plus the greater of 1% or the one-month LIBOR. The Company is currently required to make interest-only payments on the term loans through August 2017, and beginning on September 1, 2017 the Company is required to make monthly payments of interest plus equal monthly payments of principal over a term of 24 months. The Loan Agreement requires collateral by a security interest in all of the Company's assets except intellectual property (which is subject to a negative pledge) and contains customary affirmative and negative covenants, and also includes standard events of default, including payment defaults. Upon the occurrence of an event of default, a default interest rate of an additional 4% may be applied to the outstanding loan balances, and the Lender may declare all outstanding obligations immediately due and payable and take such other actions as set forth in the Loan Agreement. There were no financial covenants attached to the loan. The Loan Agreement included a closing fee of $250,000 which was paid at closing, and the Company is obligated to pay a fee equal to 8% of the term loans funded upon the earliest to occur of the maturity date, the acceleration of the term loans or the voluntary prepayment of the term loans. The cost of these fees is being amortized as interest expense over the term of the loan using the effective-interest method. The Company may voluntarily prepay all, but not less than all, of the outstanding term loans. The Loan Agreement contains customary representations, warranties and covenants. In addition, the Loan Agreement contains customary events of default that entitle the Lender to cause the Company's indebtedness under the Loan Agreement to become immediately due and payable.

On August 5, 2015, pursuant to the Loan Agreement, the Company entered into a Success Fee Agreement with the Lender under which the Company agreed to pay the Lender $1.0 million if the Company obtains FDA approval to market plazomicin. If such approval is obtained, the Success Fee shall be due the later of (i) August 5, 2019 or (ii) the date such FDA approval is obtained. The fair value of the Success Fee at the date of issuance of approximately $356,000 was recorded as a debt discount and is being amortized as interest expense over the term of the loan using the effective-interest method.

Future principal debt payments on the loan payable are as follows (in thousands):

	December 31, 2016
2017	$ 4,167
2018	12,500
2019	8,333
Total principal payments	25,000
Final fee due at maturity in 2019	2,000
Total principal and final fee payments	27,000
Unamortized discount and debt issuance costs	(1,723)
Less current portion	(4,167)
Loan payable, long term	$ 21,110

The obligation includes a final fee of $2,000,000, representing 8% of the term loan funded, which accretes over the life of the loan as interest expense. The Company recorded interest expense related to the loan of $2,320,000 and $699,000 for the years ended December 31, 2016 and 2015, respectively.

Oxford Finance and SVB Loan Agreement

In November 2011, the Company entered into a loan and security agreement (the “Oxford and SVB Loan Agreement”), with Oxford Finance LLC and Silicon Valley Bank (“SVB”) under which the Company borrowed $4,000,000 in November 2011, and $8,000,000 in April 2012.

The interest rate, which was fixed at the closing of each tranche, equaled the three-month LIBOR plus 7.75%. The interest rates for the tranches under the Oxford and SVB Loan Agreement were 8.18% and 8.22% per annum. Payments were monthly in arrears and interest only until September 1, 2012, followed by equal monthly payments of principal and interest through June 2014, when the loan was repaid in full. In addition, a final payment equal to 8.25% of the aggregate amount drawn was due upon termination of the Oxford and SVB Loan Agreement, which was accreted as interest expense over the term of the loan using the effective-interest method, with the remaining balance charged to interest expense upon loan repayment. The loan principal balance, accrued interest and the final payment under the Oxford and SVB Loan Agreement totaling $4,454,000 were repaid in full in June 2014.

During 2012 and 2011, in connection with the Oxford and SVB Loan Agreement, the Company issued warrants to Oxford Finance LLC and SVB to purchase 20,016 and 10,008 shares, respectively, of its Series C convertible preferred stock at an exercise price of $11.99 per share. The fair value of these warrants at the date of issuance was approximately $163,000 and $86,000, respectively, and was recorded as a debt discount and was amortized as interest expense over the term of the loan using the effective-interest method, with the remaining balance charged to interest expense upon loan repayment.

Immediately prior to the closing of the IPO, these warrants automatically converted into warrants exercisable for shares of common stock, resulting in the reclassification of the related preferred stock warrant liabilities to additional paid-in capital. As of December 31, 2016, these warrants remained outstanding and exercisable.

The Company recorded interest expense related to the Oxford and SVB Loan Agreement of $397,000 for the year ended December 31, 2014.

9. Stockholders' Equity and Convertible Preferred Stock

Stockholders’ Equity

On April 7, 2015, the Company entered into a Sales Agreement (the “Sales Agreement”) with Cowen and Company, LLC (“Cowen”), pursuant to which the Company may issue and sell shares of its common stock having aggregate sales proceeds of up to $30.0 million from time to time through an ATM equity program under which Cowen acts as sales agent.

As of December 31, 2016, the Company had sold 1,105,549 shares of common stock under the Sales Agreement, at a weighted-average price of approximately $4.82 per share for gross proceeds of $5.3 million and net proceeds of $5.1 million after deducting the sales commissions and offering expenses. As of December 31, 2016,

$24.7 million of common stock remained available to be sold under the Sales Agreement, subject to certain conditions specified therein.

Convertible Preferred Stock

Immediately prior to the completion of the Company's IPO, all of the outstanding shares of convertible preferred stock automatically converted into 10,386,894 shares of common stock. Each share of Series A, B, C, and D convertible preferred stock converted into common shares at a conversion rate of approximately 1.15, 1.33, 1.00 and 1.00 shares of common stock, respectively.

In May 2013, the Company completed the first of two tranches of its Series D round of financing. The majority of the first tranche was received in March 2013 and the Company issued 1,110,252 shares of Series D convertible preferred stock at $11.99 per share to existing investors in exchange for cash proceeds of $10,581,000 and conversion of outstanding loans and accrued interest in the aggregate of $2,732,000 under the 2012 Bridge Loan Agreement. The remaining amount of the first tranche was received in May 2013 from a new investor for additional cash proceeds of $1,778,000 for the issuance of 148,289 shares at a price of $11.99 per share. The second tranche was closed in November 2013. The Company issued 834,031 additional shares of Series D convertible preferred stock at $11.99 per share for gross cash proceeds of $10,000,000.

Warrants

On June 3, 2016, the Company sold 7,999,996 shares of its common stock and warrants to purchase 1,999,999 shares of its common stock pursuant to the Purchase Agreement for aggregate gross proceeds of $25.4 million in the Private Placement. The warrants have an exercise price of $3.66 per share and are exercisable up to five years from the date of issuance. The Company's Chief Operating Officer, a related party, participated in the Private Placement by purchasing 141,453 shares of common stock and a warrant to purchase 35,363 shares of common stock for an aggregate purchase price of $0.5 million. Issuance costs of $0.3 million were offset against equity as a reduction from gross proceeds.

At the close of the Private Placement, the estimated fair values of the common stock and warrants issued were $22.9 million and $2.6 million, respectively. In December 2016, certain holders of these warrants exercised warrants to purchase 707,269 shares of common stock, and after giving effect to net exercises, upon such exercises the Company issued an aggregate of 610,490 shares of common stock, with an estimated fair value at the time of exercise of $8.3 million. The Company recorded a charge of $7.4 million, for the increase in the estimated fair value, in the consolidated statements of operations, for the year ended December 31, 2016. At December 31, 2016, the Company estimated the fair value of the remaining warrants outstanding to be $13.9 million and recorded a charge of $12.2 million, for the change in the estimated fair value, in the consolidated statements of operations, for the year ended December 31, 2016.

As of December 31, 2016, the following warrants to purchase shares of common stock were outstanding and exercisable:

Warrant Holder	Issue Date	In Connection With	Warrant to Purchase	Shares	Exercise Price	Expiration Date
Oxford Finance LLC	4/30/2012	Loan agreement	Common stock	11,676	$ 11.99	11/1/2021
SVB	4/30/2012	Loan agreement	Common stock	8,340	$ 11.99	11/1/2021
Oxford Finance LLC	11/1/2011	Loan agreement	Common stock	5,838	$ 11.99	11/1/2021
SVB	11/1/2011	Loan agreement	Common stock	4,170	$ 11.99	11/1/2021
Growth Equity Opportunities Fund IV,	6/3/2016	Private Placement	Common stock	1,178,782	$ 3.66	6/3/2021

LLC						
DAFNA Lifescience, L.P.	6/3/2016	Private Placement	Common stock	47,151	$ 3.66	6/3/2021
DAFNA Lifescience Select, L.P.	6/3/2016	Private Placement	Common stock	31,434	$ 3.66	6/3/2021
Blake A. Wise Trust	6/3/2016	Private Placement	Common stock	35,363	$ 3.66	6/3/2021
				1,322,754		

In February 2017, certain holders of these warrants exercised warrants to purchase 91,095 shares of common stock, and after giving effect to net exercises, upon such exercises the Company issued an aggregate of 84,481 shares of common stock and received $0.3 million in proceeds.

10. Equity Incentive Plans

2014 Plan

In February 2014, the Company's stockholders approved the 2014 Equity Incentive Award Plan (the "2014 Plan"), which became effective as of March 11, 2014. Under the 2014 Plan, the Company may grant incentive stock options ("ISOs"), nonstatutory stock options, stock appreciation rights, restricted stock awards, restricted stock unit awards ("RSUs") and other stock-based awards for the purchase of common stock. Effective January 1, 2016, the compensation committee of the board of directors approved an evergreen increase of 735,808 shares of common stock that may be granted in accordance with the terms of the 2014 Plan. As of December 31, 2016, 621,286 shares were available for future issuance under the 2014 Plan.

Under the 2014 Plan, the terms of stock award agreements, including vesting requirements, are determined by the board of directors, subject to the provisions of the 2014 Plan. Options granted by the Company typically vest over a four year period and the exercise price may not be less than fair market value on the date of grant. Certain of the options are subject to acceleration of vesting in the event of certain change of control transactions. Options granted under the 2014 Plan expire no later than 10 years from the date of grant.

2014 Employment Commencement Incentive Plan

In December 2014, the Company adopted a 2014 Employment Commencement Incentive Plan (the "Inducement Plan"). The Inducement Plan is designed to comply with the inducement exemption contained in Nasdaq's Rule 5635(c)(4), which provides for the grant of non-qualified stock options, restricted stock units, restricted stock awards, performance awards, dividend equivalents, deferred stock awards, deferred stock units, stock payment and stock appreciation rights to a person not previously an employee or director of the Company, or following a bona fide period of non-employment, as an inducement material to the individual's entering into employment with the Company. As of December 31, 2016, a total of 1,150,000 shares of common stock have been authorized under the Inducement Plan, including the additional 500,000 shares that became available resulting from an amendment adopted by the board of directors as of March 17, 2016. As of December 31, 2016, 18,088 shares were available for issuance under the Inducement Plan.

2014 Employee Stock Purchase Plan

In February 2014, the Company's stockholders approved the 2014 Employee Stock Purchase Plan (the "ESPP"), which became effective as of March 11, 2014. The number of shares of common stock initially reserved for issuance under the ESPP was 145,454 shares. Effective January 1, 2016, the board of directors approved an evergreen increase of 183,952 shares that may be granted in accordance with the terms of the ESPP. As of December 31, 2016, 225,261 shares of common stock have been issued to employees participating in the ESPP, and 283,216 shares were available for issuance under the ESPP.

Amended and Restated 2003 Stock Plan

The Company's Amended and Restated 2003 Stock Plan, referred to herein as the 2003 Plan, provided for the granting of incentive and non-statutory stock options to employees, directors and consultants at the discretion of the board of directors. The Company granted options under its 2003 Plan until January 2014 when it was terminated as to future

awards, although it continues to govern the terms of options that remain outstanding under the 2003 Plan.

Options granted under the 2003 Plan expire no later than 10 years from the date of grant. Options granted under the 2003 Plan vest over periods determined by the board of directors, generally over four years.

In connection with the Board of Directors and stockholders approval of the 2014 Plan, all remaining shares available for future awards under the 2003 Plan were transferred to the 2014 Plan, and the 2003 Plan was terminated as to future awards. As of December 31, 2016, a total of 877,234 shares of common stock are subject to options

outstanding under the 2003 plan, which shares will become available under the 2014 Plan to the extent the options are forfeited or lapse unexercised.

Total stock-based compensation recognized in the Company's consolidated statements of operations for the years ended December 31, 2016, 2015 and 2014, was classified as follows (in thousands):

	Year Ended December 31,		
	2016	2015	2014
Research and development	$2,165	$1,404	$570
General and administrative	1,682	1,579	1,480
Total	$3,847	$2,983	$2,050

A summary of stock option activity is as follows:

		Outstanding Options			
	Shares	Number of	Weighted-Average		Aggregate Intrinsic
	Available for gran	Shares	Exercise Price	Weighted-Average Remaining Contractual Life (in years)	Value (in thousands)
Balance, January 1, 2014	127,277	1,405,550	$ 5.68		
Additional shares reserved	1,190,908	—			
Shares reserved for the 2014 Employment Commencement Incentive Plan	650,000	—			
Options granted	(876,163)	876,163	$ 10.15		
RSUs granted	(168,200)	—			
Options exercised	—	(208,693)	$ 3.38		$ 1,704
Options forfeited	187,648	(187,648)	$ 6.29		
Balance, December 31, 2014	1,111,470	1,885,372	$ 7.95		
Additional shares reserved	716,285	—			
Options granted	(929,100)	929,100	$ 7.95		
Options exercised	—	(190,128)	$ 5.54		$ 923
Options forfeited	237,007	(237,007)	$ 10.22		
RSUs granted	(291,525)	—			
RSUs cancelled	49,325	—			
Balance, December 31, 2015	893,462	2,387,337	$ 7.92		$ 293
Additional shares reserved	1,235,808	—			
Options granted	(1,477,600)	1,477,600	$ 4.10		
Options exercised	—	(14,190)	$ 4.59		$ 89
Options forfeited	310,454	(310,454)	$ 8.19		
RSUs granted	(380,500)	—			
RSUs cancelled	57,750	—			

Balance, December 31, 2016	639,374	3,540,293	$ 6.31	7.98	$ 23,837
At December 31, 2016:					
Vested and exercisable		1,315,306	$ 7.41	6.71	$ 7,441
Vested and expected to vest		3,453,530	$ 6.27	8.02	$ 23,408

The following table summarizes information about stock options outstanding as of December 31, 2016:

	Options Outstanding		Vested and Exercisable	
Exercise Price	Number of Options	Weighted-Average Remaining Contractual Life (in Years)	Number of Options	Weighted-Average Exercise Price
$2.64 - $3.41	1,137	1.13	1,137	$ 2.69
$3.65	504,153	9.16	64,101	$ 3.65
$3.68 - $4.34	605,058	9.36	12,429	$ 4.27
$4.44 - $4.84	362,041	7.52	199,867	$ 4.73
$4.86 - $5.86	458,062	9.1	115,516	$ 5.73
$6.60 - $6.99	447,807	6.25	297,277	$ 6.91
$7.08 - $8.04	546,877	6.5	294,696	$ 7.53
$9.21 - $10.44	409,489	7.67	205,140	$ 9.65
$11.78 - $12.22	152,659	7.88	88,818	$ 11.93
$14.89	53,010	7.17	36,325	$ 14.89
	3,540,293	7.98	1,315,306	$ 7.41

Stock Options Granted to Employees and Non-Employee Directors

During the years ended December 31, 2016, 2015 and 2014, the Company granted stock options to employees and directors to purchase 1,477,600, 929,100 and 876,163 shares, respectively, of common stock under the stock plans with a weighted-average estimated grant-date fair value of $4.10, $5.02 and $6.41 per share, respectively. As of December 31, 2016, there were unrecognized compensation costs of $6,695,000 related to outstanding employee and non-employee director stock options, which are expected to be recognized over a weighted-average period of 2.96 years.

The Company estimated the fair value of stock options using the Black-Scholes option valuation model for options with time-based vesting terms. The Black-Scholes model requires the input of subjective assumptions, including (a) the expected term of the award, (b) the expected stock price volatility, (c) the risk-free interest rate and (d) expected dividends. The estimated fair value of these employee stock options is being amortized on a straight-line basis over the requisite service period of the awards. The fair value of the employee stock options was estimated using the following weighted-average assumptions:

	Year Ended December 31,		
	2016	2015	2014
Expected term	5.3–6.0 years	5.4–6.0 years	5.3–6.1 years
Expected volatility	67%–74%	65%–75%	67%–77%
Risk-free interest rate	1.1%–1.5%	1.5%–1.9%	1.7%–2.0%
Expected dividend yield	—%	—%	—%

The Company has opted to use the “simplified method” for estimating the expected term of options, whereby the expected term equals the arithmetic average of the vesting term and the original contractual term of the option. Prior to the Company's IPO in March 2014, due to the Company’s limited operating history and company specific stock price volatility data, the Company based its estimate of expected volatility on the historical price volatility of a group of similar companies that are publicly traded. Beginning in 2014 the Company began to include the historical price volatility of its own stock, along with data for the group of similar companies, to estimate expected volatility. When

selecting these public companies to use in estimating its expected stock price volatility, the Company selected companies with comparable characteristics to it, including enterprise value, stages of clinical development, risk profiles, position within the industry and with historical share price information sufficient to meet the expected life of the stock-based awards. The risk-free rate assumption is based on the U.S. Treasury instruments with maturities similar to the expected term of the Company's stock options. The expected dividend assumption is based on the Company's history of not paying dividends and its expectation that it will not declare dividends for the foreseeable future.

Stock Options Granted to Non-Employees

During the year ended December 31, 2016, the Company granted to a non-employee an option to purchase 15,000 shares of common stock. The Company did not grant stock options to non-employees during the years ended December 31, 2015 and 2014. The Company recorded non-employees stock-based compensation expense of approximately $71,000 for the year ended December 31, 2016. The Company measures the estimated fair value of the award for each period until the award is fully vested. The fair value of options granted to non-employees during the year ended December 31, 2016 was estimated using Black-Scholes with the following assumptions:

	Year Ended December 31, 2016
Expected term	0.8–1.0 years
Expected volatility	63%–125%
Risk-free interest rate	0.6%–0.9%
Expected dividend yield	—%

Restricted Stock Units Granted to Employees and Non-Employee Directors

During the years ended December 31, 2016, 2015 and 2014, the Company granted restricted stock units (“RSUs”) to employees to purchase 380,500, 291,525 and 168,200 shares of common stock, respectively, under the stock plans with a weighted-average estimated grant-date fair value of $4.01 $7.76 and $9.33 per share, respectively. RSUs generally vest annually over a 4-year service period and vesting is contingent on continued service. As of December 31, 2016, there were unrecognized compensation costs of $2,853,000 related to outstanding RSUs, which are expected to be recognized over a weighted-average period of 2.78 years.

A summary of RSU activity is as follows:

	RSU Awards Outstanding		
	Number of Shares	Weighted-Average Grant Date Fair Market Value	Aggregate Intrinsic Value (in thousands)
Balance, December 31, 2013	—	—	—
RSUs granted	168,200	$ 9.33	
Balance, December 31, 2014	168,200	$ 9.33	$ 2,195
RSUs granted	291,525	$ 7.76	
RSUs released	(38,376)	$ 9.42	
RSUs cancelled	(49,325)	$ 9.80	
Balance, December 31, 2015	372,024	$ 8.02	$ 2,135
RSUs granted	380,500	$ 4.01	
RSUs released	(89,722)	$ 8.22	
RSUs cancelled	(57,750)	$ 6.71	
Balance, December 31, 2016	605,052	$ 5.60	$ 7,878

Stock Options and Restricted Stock Units Granted to Employees that Contain Performance Conditions

During the years ended December 31, 2016, 2015 and 2014, the Company granted options to purchase an aggregate of 354,250, zero and 168,977 shares of common stock and 59,925, zero and zero RSUs that vest upon the achievement of market-based common stock price targets.

The fair value was estimated at the grant date using a Monte-Carlo simulation model ("Monte-Carlo"), which requires the use of a range of assumptions. The expected life assumption is not used in the Monte-Carlo simulation model, but the output of the model indicates an expected life. The associated stock-based compensation expense is being recognized on a straight-line basis over the implicit service period (expected time to vest) derived from that simulation model. The fair value of awards granted to non-employees was estimated using Monte-Carlo with the following assumptions:

	Year Ended December 31,	
	2016	2014
Expected term	2.2–6.0 years	2.9–6.3 years
Expected volatility	70%	60–70%
Risk-free interest rate	1.4%–2.2%	1.5%–2.8%
Expected dividend yield	—%	—%

11. Income Taxes

A reconciliation of the statutory tax rates and the effective tax rates for the years ended December 31, 2016, 2015 and 2014 is as follows:

	Year Ended December 31,		
	2016	2015	2014
Statutory tax rate	34.00 %	34.00 %	34.00 %
State taxes, net of federal benefits	0.96 %	-3.62 %	5.04 %
Stock-based compensation	-0.62 %	-1.20 %	-0.76 %
Credits	1.46 %	3.30 %	3.21 %
Other	-0.10 %	-0.54 %	-1.74 %
Valuation allowance	-26.22%	-31.94%	-39.75%
Warrant Valuation	-9.48 %	0.00 %	0.00 %
Effective tax rate	0.00 %	0.00 %	0.00 %

The tax effects of temporary differences and carryforwards that give rise to the Company's deferred tax assets are as follows (in thousands):

	December 31,	
	2016	2015
Deferred tax assets:		
Net operating loss carry forwards	$71,858	$57,558
Research and development credit	10,969	8,531
Intangible assets	1,653	1,994
Depreciation	191	195
Temporary differences	4,682	2,396
Gross Deferred tax assets	89,353	70,674
Less: valuation allowance	(89,353)	(70,674)
Net deferred tax assets	$—	$—

Realization of the deferred tax assets is dependent upon future taxable income, if any, the amount and timing of which are uncertain. Accordingly, the net deferred tax assets have been fully offset by a valuation allowance. The net valuation allowance increased by $18,679,000 and $7,975,000 during the years ended December 31, 2016 and 2015, respectively.

The Company had federal and state net operating loss carryforwards of approximately $196,669,000 and $90,810,000, respectively, at December 31, 2016. The federal and state net operating loss carryforwards are available to reduce future taxable income, if any. If not utilized, the federal and state operating loss carryforwards will begin to expire in various amounts beginning 2023 and 2017, respectively. The Company also had federal and state research and development credit carryforwards of approximately $8,965,000 and $5,186,000, respectively, at December 31, 2016. The federal research and development credits will begin to expire in 2025. The state research and development credits

can be carried forward indefinitely.

Utilization of the net operating loss and research and development credits carryforwards may be subject to an annual limitation due to the ownership change limitations provided by the Internal Revenue Code of 1986 and

similar state provisions. The annual limitation may result in the expiration of the net operating loss and research and development credits before utilization.

The Company files income tax returns in the U.S. federal jurisdiction and various state jurisdictions. The Company is subject to U.S. federal and state income tax examinations by tax authorities for tax years from 2003 due to net operating losses and tax credits that are being carried forward for tax purposes.

The Company recognizes the financial statements effects of a tax position when it is more likely than not, based on technical merits, that the position will be sustained upon examination. A reconciliation of the Company's unrecognized tax benefits is as follows (in thousands):

	December 31,		
	2016	2015	2014
Balance at beginning of year	$957	$—	$ —
Increase related to current year tax provision	240	162	—
Increase related to prior year tax provision	—	795	—
Balance at end of year	$1,197	$957	$ —

The unrecognized tax benefits, if recognized and in absence of full valuation allowance, would impact the income tax provision by $1,024,000, $820,000 and $678,000 as of December 31, 2016, 2015 and 2014. Given the Company's valuation allowance, the uncertain tax positions would not impact the effective tax rates.

The Company has elected to include interest and penalties as a component of tax expense. There was no interest or penalties accrued related to uncertain tax positions as of December 31, 2016.

12. Employee Benefit Plan

In 2003, the Company adopted a 401(k) plan for its employees whereby eligible employees may contribute up to 100% of their compensation, on a pretax basis, subject to the maximum amount permitted by the Internal Revenue Code. In December 2010, the Company approved a plan to provide matching contributions equal to 50% of employees' contributions, up to 6% of annual earnings, starting in January 2011. In December 2015, the Company has changed the plan to increase its 401(k) match to 50% of employees' contributions, up to 8% of annual earnings, starting in January 2016. The Company's contributions were $469,000, $255,000 and $184,000 for the years ended December 31, 2016, 2015 and 2014, respectively.

13. Related-Party Transactions

In 2016, the Company sold 7,999,996 shares of its common stock and warrants to purchase 1,999,999 shares of its common stock pursuant to the Purchase Agreement for aggregate gross proceeds of $25.4 million in the Private Placement. The warrants have an exercise price of $3.66 per share and are exercisable up to five years from the date of issuance. The Company's Chief Operating Officer, a related party, participated in the Private Placement by purchasing 141,453 shares of common stock and a warrant to purchase 35,363 shares of common stock for an aggregate purchase price of $0.5 million. For further detail of the warrants issued in connection with the Private Placement, refer to Note 9.

14. Subsequent Events

In March 2017, the Company entered into a commercial validation and manufacturing agreement (the "Manufacturing Agreement") with Hovione Limited ("Hovione"). Under the Manufacturing Agreement, Hovione has agreed to complete the validation program to validate and scale up the Company's technology to manufacture the active pharmaceutical ingredient for plazomicin (the "Product") and supply the Product to the Company. The Manufacturing Agreement has an initial term of seven years after the first delivery of the Product.

Subject to the successful completion of the validation program and the Company's launch of plazomicin, the Company has agreed to purchase a minimum quantity of the Product from Hovione depending on the Company's requirements and the period of time following approval by the FDA. For the first three years following approval of plazomicin by the FDA, the Company is required to purchase at least 80% of its required quantity from Hovione. Following the initial three years after FDA approval, the Company is required to purchase between 40% and 66% of its required quantity from Hovione, depending on the amounts required during any such fiscal year. Contingent upon FDA's approval of plazomicin, the Company has minimum annual purchase commitments from Hovione, beginning in 2020 through 2024.

15. Selected Unaudited Quarterly Financial Data

The following tables show a summary of the Company's unaudited quarterly financial data for each of the four quarters of 2016, 2015 and 2014 (in thousands, except per share amounts):

	Three Months Ended			
	December 31, 2016	September 30, 2016	June 30, 2016	March 31, 2016
Contract revenue	10,734	16,046	9,144	5,849
Operating expenses	22,796	24,996	25,659	17,670
Other income (expense), net	(17,662)	(2,088)	(1,753)	(376)
Net loss	(29,724)	(11,038)	(18,268)	(12,197)
Basic and diluted net loss per common share	(1.04)	(0.41)	(0.87)	(0.66)

	Three Months Ended			
	December 31, 2015	September 30, 2015	June 30, 2015	March 31, 2015
Contract revenue	4,664	4,476	12,041	4,880
Operating expenses	15,548	13,006	12,970	11,110
Other income (expense), net	(382)	(232)	43	51
Net loss	(11,266)	(8,762)	(886)	(6,179)
Basic and diluted net loss per common share	(0.61)	(0.48)	(0.05)	(0.34)

	Three Months Ended			
	December 31, 2014	September 30, 2014	June 30, 2014	March 31, 2014
Contract revenue	4,259	4,520	5,203	5,988
Operating expenses	9,140	12,853	8,541	9,222

Other income and expense, net	27	21	(217)	(221)
Net loss	(4,854)	(8,312)	(3,555)	(3,455)
Basic and diluted net loss per common share	(0.27)	(0.47)	(0.20)	(1.00)

(1) Basic and diluted net loss per common share are computed independently for each of the quarters presented. Therefore, the sum of quarterly basic and diluted per share information may not equal annual basic and diluted net loss per common share.

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

None.

Item 9A. Controls and Procedures.

Evaluation of Disclosure Controls and Procedures

We maintain disclosure controls and procedures that are designed to ensure that information required to be disclosed in our reports under the Securities Exchange Act of 1934, as amended, or the Exchange Act, and the rules and regulations thereunder, is recorded, processed, summarized and reported within the time periods specified in the SEC's rules and forms and that such information is accumulated and communicated to our management, including our principal executive officer and principal financial officer, as appropriate, to allow for timely decisions regarding required disclosure. In designing and evaluating the disclosure controls and procedures, management recognizes that any controls and procedures, no matter how well designed and operated, can provide only reasonable assurance of achieving the desired control objectives, and management is required to apply its judgment in evaluating the cost-benefit relationship of possible controls and procedures.

As required by Rule 13a-15(b) under the Exchange Act, our management, under the supervision and with the participation of our principal executive officer and principal financial officer, has evaluated the effectiveness of the design and operation of our disclosure controls and procedures (as such term is defined in Rules 13a-15(e) and 15d-15(e) under the Exchange Act) as of December 31, 2016. Based on such evaluation, our principal executive officer and principal financial officer have concluded that, as of December 31, 2016, our disclosure controls and procedures were effective at the reasonable assurance level.

Management's Annual Report on Internal Control Over Financial Reporting

Our management is responsible for establishing and maintaining adequate internal control over financial reporting. Internal control over financial reporting is a process designed by, or under the supervision of, our Principal Executive Officer and Principal Financial Officer to provide reasonable assurance regarding the reliability of financial reporting and the preparation of consolidated financial statements for external purposes in accordance with generally accepted accounting principles and includes those policies and procedures that (1) pertain to the maintenance of records that in reasonable detail accurately and fairly reflect the transactions and dispositions of our assets; (2) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that our receipts and expenditures are being made only in accordance with authorizations of our management and directors; and (3) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use or disposition of our assets that could have a material effect on our consolidated financial statements.

Under the supervision and with the participation of our management, including our Principal Executive Officer and Principal Financial Officer, we conducted an evaluation of the effectiveness of our internal control over financial reporting based on criteria established in "Internal Control-Integrated Framework (2013)" issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO). Our management concluded that our internal control over financial reporting was effective as of December 31, 2016.

Attestation Report on Internal Control over Financial Reporting

This Annual Report on Form 10-K does not include an attestation report of our independent registered public accounting firm on internal control over financial reporting due to the deferral allowed under the JOBS Act for emerging growth companies.

Changes in Internal Control Over Financial Reporting

There were no changes in our internal controls over financial reporting identified in connection with the evaluation required by Rule 13a-15(d) and 15d-15(d) of the Exchange Act that occurred during the quarter ended December 31, 2016 that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

Item 9B. Other Information.

The information set forth below is included herein for the purpose of providing the disclosure required under “Item 1.01 - Entry into a Material Definitive Agreement” of Form 8-K.

On March 9, 2017, we entered into a commercial validation and manufacturing agreement (the "Manufacturing Agreement") with Hovione Limited ("Hovione"). Under the Manufacturing Agreement, Hovione has agreed to complete the validation program to validate and scale up our technology to manufacture the active pharmaceutical ingredient for plazomicin and manufacture and supply the active pharmaceutical ingredient for plazomicin (the "Product") to us.

After the successful completion of the validation program and subject to our launch of plazomicin, we have agreed to purchase a minimum quantity of the Product from Hovione depending on our requirements and the period of time following approval by the FDA. For the first three years following approval of plazomicin by the FDA, we are required to purchase at least 80% of our required quantity from Hovione. Following the initial three years after FDA approval, we are required to purchase between 40% and 66% of our required quantity from Hovione, depending on the amounts required during any such year. Contingent upon FDA's approval of plazomicin, the Company has minimum annual purchase commitments from Hovione, beginning in 2020 through 2024. Beyond the minimum purchase obligation contained in the Manufacturing Agreement, we may use other suppliers and Hovione is obligated to cooperate with us in such efforts, including by performing certain technology transfers.

The term of the Validation and Manufacturing Agreement continues for an initial term of seven years after the first delivery of plazomicin, subject to renewing two year terms. Either we or Hovione may terminate the Manufacturing Agreement for the other party's uncured material breach or bankruptcy (or similar event), and either we or Hovione may terminate without cause on the termination of the initial term or a renewing term upon written notice twenty-four months' prior to the end of the respective term. We may terminate the Manufacturing Agreement if: (1) we fail to gain FDA approval, within a certain period of time after submission of our NDA for plazomicin; (2) we withdraw an NDA for plazomicin; or (3) we discontinue development or sales of plazomicin. Upon termination of the Manufacturing Agreement and depending on the form of termination, we may be required to pay Hovione the sum of the remaining minimum purchasing commitments for the year of termination and the following two years remaining in the term, if any.

The Manufacturing Agreement includes standard and customary provisions regarding, among other things, compliance with laws and regulations, confidentiality, representations and warranties, liability, indemnification, insurance, remedies, dispute resolution and assignability.

The foregoing description of the Manufacturing Agreement does not purport to be complete and is subject to, and is qualified in its entirety by, reference to the Manufacturing Agreement, which shall be filed as an exhibit to our Quarterly Report on Form 10-Q for the quarterly period ending March 31, 2017. We intend to seek confidential treatment for certain portions of the Manufacturing Agreement pursuant to a Confidential Treatment Request to be submitted to the Securities and Exchange Commission pursuant to Rule 24b-2 under the Securities Exchange Act of 1934, as amended.

PART III

Item 10. Directors, Executive Officers and Corporate Governance.

The information required by this item will be contained in our definitive Proxy Statement for our 2017 Annual Meeting of Stockholders to be filed with the Securities and Exchange Commission on Schedule 14A in connection with our 2017 Annual Meeting of Stockholders (the "Proxy Statement"), which will be filed not later than 120 days after the end of our fiscal year ended December 31, 2016, under the headings "Executive Officers," "Election of Directors," "Corporate Governance," and " Section 16(a) Beneficial Ownership Reporting Compliance," and is incorporated herein by reference.

We have adopted a Code of Business Conduct and Ethics that applies to our officers, directors and employees which is available on our website at www.achaogen.com. The Code of Business Conduct and Ethics is intended to qualify as a "code of ethics" within the meaning of Section 406 of the Sarbanes-Oxley Act of 2002 and Item 406 of Regulation S-K. In addition, we intend to promptly disclose (1) the nature of any amendment to our Code of Business Conduct and Ethics that applies to our principal executive officer, principal financial officer, principal accounting officer or controller or persons performing similar functions and (2) the nature of any waiver, including an implicit waiver, from a provision of our code of ethics that is granted to one of these specified officers, the name of such person who is granted the waiver and the date of the waiver on our website in the future.

Item 11. Executive Compensation.

The information required by this item will be contained in our definitive Proxy Statement for our 2017 Annual Meeting of Stockholders under the headings "Executive Compensation" and "Director Compensation," and is incorporated herein by reference.

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

The information required by this item will be contained in our definitive Proxy Statement for our 2017 Annual Meeting of Stockholders under the headings "Security Ownership of Certain Beneficial Owners and Management" and "Equity Compensation Plan Information," and is incorporated herein by reference.

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

The information required by this item will be contained in our definitive Proxy Statement for our 2017 Annual Meeting of Stockholders under the headings "Certain Relationships and Related Party Transactions" and "Corporate Governance," and is incorporated herein by reference.

Item 14. Principal Accounting Fees and Services.

The information required by this item will be contained in our definitive Proxy Statement for our 2017 Annual Meeting of Stockholders under the heading "Principal Accounting Fees and Services," and is incorporated herein by reference.

PART IV

Item 15. Exhibits and Financial Statement Schedules.

(a) The following documents are filed as part of this report:

1. Financial Statements

See Index to Financial Statements at Item 8 herein.

2. Financial Statement Schedules

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

3. Exhibits

See the Exhibit Index immediately following the signature page of this Annual Report on Form 10-K.

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.

Date: March 14, 2017 ACHAOGEN, INC.

By: /s/ Kenneth J. Hillan
Kenneth J. Hillan, M.B., Ch.B.
President and Chief Executive Officer

(principal executive officer)

Date: March 14, 2017 ACHAOGEN, INC.

By: /s/ Tobin C. Schilke
Tobin C. Schilke
Chief Financial Officer

(principal financial and accounting officer)

POWER OF ATTORNEY

KNOW ALL PERSONS BY THESE PRESENTS, that each person whose signature appears below constitutes and appoints each of Kenneth J. Hillan, M.B., Ch.B., Tobin C. Schilke and Gary Loeb his or her true and lawful attorney-in-fact and agent, with full power of substitution, for him or her and in his or her name, place and stead, in any and all capacities, to sign any and all amendments to this annual report on Form 10-K, and to file the same, with all exhibits thereto, and other documents in connection therewith, with the Securities and Exchange Commission, granting unto said attorney-in-fact and agent, full power and authority to do and perform each and every act and thing requisite and necessary to be done in connection therewith, as fully to all intents and purposes as he might or could do in person, hereby ratifying and confirming all that said attorney-in-fact and agent, or his substitutes or substitute, may lawfully do or cause to be done by virtue hereof.

IN WITNESS WHEREOF, each of the undersigned has executed this Power of Attorney as of the date indicated opposite his/her name.

Pursuant to the requirements of the Securities Exchange Act of 1934, this report 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/ Kenneth J. Hillan Kenneth J. Hillan, M.B., Ch.B.	President, Chief Executive Officer and Director (Principal Executive Officer)	March 14, 2017
/s/ Tobin C. Schilke Tobin C. Schilke	Chief Financial Officer (Principal Financial and Accounting Officer)	March 14, 2017
/s/ Bryan E. Roberts Bryan E. Roberts, Ph.D.	Chairman of the Board of Directors	March 14, 2017
/s/ Alan B. Colowick Alan B. Colowick, M.P.H., M.D.	Director	March 14, 2017
/s/ John C. Doyle John C. Doyle	Director	March 14, 2017
/s/ Michael Fischbach Michael Fischbach, Ph.D.	Director	March 14, 2017
/s/ Kent E. Lieginger Kent E. Lieginger, Pharm.D.	Director	March 14, 2017
/s/ John W. Smither John W. Smither	Director	March 14, 2017
/s/ Gregory Stea Gregory Stea	Director	March 14, 2017

/s/ Halley Gilbert Halley Gilbert	Director	March 14, 2017

EXHIBIT INDEX

Exhibit Number	Description of Document	Incorporated by Reference from				Provided Herewith
		Registrant's Form	File No.	Date Filed with the SEC	Exhibit Number	
3.1	Amended and Restated Certificate of Incorporation of Achaogen, Inc.	8-K	001-36323	3/17/2014	3.1	
3.2	Amended and Restated Bylaws of Achaogen, Inc.	8-K	001-36323	3/17/2014	3.2	
4.1	Form of Common Stock Certificate.	S-1/A	333-193559	2/25/2014	4.1	
4.2	Warrant issued to Oxford Finance LLC on November 1, 2011.	S-1	333-193559	1/24/2014	4.4	
4.3	Warrant issued to Silicon Valley Bank on November 1, 2011.	S-1	333-193559	1/24/2014	4.5	
4.4	Warrant issued to Oxford Finance LLC on April 30, 2012 (Term A Loan (2)).	S-1	333-193559	1/24/2014	4.6	
4.5	Warrant issued to Oxford Finance LLC on April 30, 2012 (Term B Loan).	S-1	333-193559	1/24/2014	4.7	
4.6	Form of Warrant, issued pursuant to the Securities Purchase Agreement, dated June 1, 2016, by and among Achaogen, Inc. and the purchasers named therein	S-3	333-212253	6/24/2016	4.3	
10.1(A)†	License Agreement, dated January 25, 2006, by and between the registrant and Ionis Pharmaceuticals, Inc.	S-1/A	333-193559	2/27/2014	10.5(A)	
10.1(B)†	Letter Agreement, dated January 25, 2006, by and between the registrant and Ionis Pharmaceuticals, Inc.	S-1	333-193559	1/24/2014	10.5(B)	
10.2(A)†	Contract Award issued by the Biomedical Advanced Research and Development Authority of the United States Department of Health and Human Services, dated August 30, 2010.	S-1/A	333-193559	2/27/2014	10.7(A)	
10.2(B)	Modification 0001, dated February 24, 2011, to Contract Award issued by the Biomedical Advanced Research and Development Authority of the United States Department of Health and Human Services, dated August 30, 2010.	S-1	333-193559	1/24/2014	10.7(B)	
10.2(C)†	Modification 0003, dated August 18, 2011, to Contract Award issued by the Biomedical Advanced Research and Development Authority of the United States Department of Health and Human Services, dated August 30, 2010.	S-1	333-193559	1/24/2014	10.7(C)	

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Exhibit Number	Description of Document	Incorporated by Reference from Registrant's Form	File No.	Date Filed with the SEC	Exhibit Number	Provided Herewith
10.2(D)†	Modification 0004, dated July 16, 2012, to Contract Award issued by the Biomedical Advanced Research and Development Authority of the United States Department of Health and Human Services, dated August 30, 2010.	S-1	333-193559	1/24/2014	10.7(D)	
10.2(E)†	Modification 0006, dated September 20, 2012, to Contract Award issued by the Biomedical Advanced Research and Development Authority of the United States Department of Health and Human Services, dated August 30, 2010.	S-1	333-193559	1/24/2014	10.7(E)	
10.2(F)†	Modification 0007, dated January 23, 2013, to Contract Award issued by the Biomedical Advanced Research and Development Authority of the United States Department of Health and Human Services, dated August 30, 2010.	S-1	333-193559	1/24/2014	10.7(F)	
10.2(G)†	Modification 0008, dated February 28, 2013, to Contract Award issued by the Biomedical Advanced Research and Development Authority of the United States Department of Health and Human Services, dated August 30, 2010.	S-1	333-193559	1/24/2014	10.7(G)	
10.2(H)†	Modification 0009, dated April 22, 2013, to Contract Award issued by the Biomedical Advanced Research and Development Authority of the United States Department of Health and Human Services, dated August 30, 2010.	S-1	333-193559	1/24/2014	10.7(H)	
10.2(I)†	Modification 0010, dated August 14, 2013, to Contract Award issued by the Biomedical Advanced Research and Development Authority of the United States Department of Health and Human Services, dated August 30, 2010.	S-1	333-193559	1/24/2014	10.7(I)	
10.2(J)†	Modification 0011, dated August 30, 2013, to Contract Award issued by the Biomedical Advanced Research and Development Authority of the United States Department of Health and Human Services, dated August 30, 2010.	S-1	333-193559	1/24/2014	10.7(J)	
10.2(K)†	Modification 0012, dated November 5, 2013, to Contract Award issued by the Biomedical	S-1	333-193559	1/24/2014	10.7(K)	

	Advanced Research and Development Authority of the United States Department of Health and Human Services, dated August 30, 2010.

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Exhibit Number	Description of Document	Incorporated by Reference from Registrant's Form	File No.	Date Filed with the SEC	Exhibit Number	Provided Herewith
10.2(L)†	Modification 0013, dated December 17, 2013, to Contract Award issued by the Biomedical Advanced Research and Development Authority of the United States Department of Health and Human Services, dated August 30, 2010.	S-1	333-193559	1/24/2014	10.7(L)	
10.2(M)	Modification 0014, dated April 14, 2014, to Contract Award issued by the Biomedical Advanced Research and Development Authority of the United States Department of Health and Human Services, dated August 30, 2010.	10-K/A	001-36323	4/13/2015	10.3(M)	
10.2(N)	Modification 0015, dated May 12, 2014, to Contract Award issued by the Biomedical Advanced Research and Development Authority of the United States Department of Health and Human Services, dated August 30, 2010.	10-K/A	001-36323	4/13/2015	10.3(N)	
10.2(O)	Modification 0016, dated July 10, 2014, to Contract Award issued by the Biomedical Advanced Research and Development Authority of the United States Department of Health and Human Services, dated August 30, 2010.	10-K/A	001-36323	4/13/2015	10.3(O)	
10.2(P)	Modification 0017, dated July 18, 2014, to Contract Award issued by the Biomedical Advanced Research and Development Authority of the United States Department of Health and Human Services, dated August 30, 2010.	10-K/A	001-36323	4/13/2015	10.3(P)	
10.2(Q)	Modification 0018, dated December 17, 2014, to Contract Award issued by the Biomedical Advanced Research and Development Authority of the United States Department of Health and Human Services, dated August 30, 2010.	10-K/A	001-36323	4/13/2015	10.3(Q)	
10.2(R)	Modification 0019, dated January 6, 2015, to Contract Award issued by the Biomedical Advanced Research and Development Authority of the United States Department of Health and Human Services, dated January August 30, 2010	10-Q	001-36323	5/11/2015	10.1	
10.2(S)†	Modification 0020, dated April 6, 2015, to Contract Award issued by the Biomedical	10-Q	001-36323	8/10/2015	10.1	

	Advanced Research and Development Authority of the United States Department of Health and Human Services, dated August 30, 2010

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Exhibit Number	Description of Document	Incorporated by Reference from Registrant's Form	File No.	Date Filed with the SEC	Exhibit Number	Provided Herewith
10.2(T)†	Modification 0021, dated July 8, 2015, to Contract Award issued by the Biomedical Advanced Research and Development Authority of the United States Department of Health and Human Services, dated August 30, 2010	10-Q	001-36323	11/5/2015	10.1	
10.2(U)†	Modification 0022, dated September 11, 2015, to Contract Award issued by the Biomedical Advanced Research and Development Authority of the United States Department of Health and Human Services, dated August 30, 2010	10-Q	001-36323	11/5/2015	10.2	
10.2(V)†	Modification 0023, dated February 12, 2016, to Contract Award issued by the Biomedical Advanced Research and Development Authority of the United States Department of Health and Human Services, dated August 30, 2010.	10-Q	001-36323	5/5/2016	10.1	
10.2(W)†	Modification 0024, dated May 26, 2016, to Contract Award issued by the Biomedical Advanced Research and Development Authority of the United States Department of Health and Human Services, dated August 30, 2010.	10-Q	001-36323	8/11/2016	10.1	
10.2(X)†	Modification 0025, dated August 26, 2016, to Contract Award issued by the Biomedical Advanced Research and Development Authority of the United States Department of Health and Human Services, dated August 30, 2010.	10-Q	001-36323	11/7/2016	10.1	
10.3	Loan and Security Agreement, dated November 1, 2011, by and among the registrant, Oxford Finance LLC and Silicon Valley Bank.	S-1	333-193559	1/24/2014	10.8	
10.4	Third Amended and Restated Investors' Rights Agreement, dated March 6, 2013, by and among the registrant and certain stockholders.	S-1	333-193559	1/24/2014	10.15	
10.6(A)	Amended and Restated Lease Agreement, dated December 29, 2010, by and between the registrant and ARE-San Francisco No. 17, LLC.	S-1	333-193559	1/24/2014	10.9(A)	
10.6(B)	Letter Agreement, dated January 4, 2011, by and between the registrant and ARE-San	S-1	333-193559	1/24/2014	10.9(B)	

	Francisco No. 17, LLC.			
10.6(C)	Letter Agreement, dated June 15, 2011, by and between the registrant and ARE-San Francisco No. 17, LLC.	S-1	333-193559	1/24/2014 10.9(C)

Exhibit Number	Description of Document	Incorporated by Reference from Registrant's Form	File No.	Date Filed with the SEC	Exhibit Number	Provided Herewith
10.6(D)	First Amendment, dated April 1, 2013, to that certain Amended and Restated Lease Agreement, dated December 29, 2010, by and between the registrant and ARE-San Francisco No. 17, LLC.	S-1	333-193559	1/24/2014	10.9(D)	
10.6(E)	Second Amendment, dated June 28, 2013, to that certain Amended and Restated Lease Agreement, dated as of December 29, 2010, by and between the registrant and ARE-San Francisco No. 17, LLC.	S-1	333-193559	1/24/2014	10.9(E)	
10.5	Lease dated August 12, 2016, by and between AP3-SF2 CT South, LLC and Achaogen, Inc.	10-Q	001-36323	11/7/2016	10.2	
10.7(A)#	Achaogen, Inc. Amended and Restated 2003 Stock Plan, as amended.	S-8	333-195348	4/17/2014	99.1	
10.7(B)#	Amendment to Amended and Restated 2003 Stock Plan, as amended.	10-K	001-36323	3/16/2015	10.8(B)	
10.7(C)#	Form of Stock Option Agreement under Achaogen, Inc. Amended and Restated 2003 Stock Plan.	S-1	333-193559	1/24/2014	10.1(B)	
10.8(A)#	Achaogen, Inc. 2014 Equity Incentive Award Plan.	S-8	333-195348	4/17/2014	99.3	
10.8(B)#	Form of Stock Option Agreement under Achaogen, Inc. 2014 Equity Incentive Award Plan.	S-1/A	333-193559	2/12/2014	10.2(B)	
10.8(C)#	Form of Restricted Stock Agreement under Achaogen, Inc. 2014 Equity Incentive Award Plan.	S-1/A	333-193559	2/12/2014	10.2(C)	
10.8(D)#	Form of Restricted Stock Unit Award Grant Notice and Restricted Stock Unit Award Agreement under Achaogen, Inc. 2014 Equity Incentive Award Plan.	10-K	001-36323	3/15/2016	10.18(D)	
10.9#	Achaogen, Inc. 2014 Employee Stock Purchase Plan.	S-8	333-195348	4/17/2014	99.7	
10.10(A)#	Achaogen, Inc. 2014 Employment Commencement Incentive Plan.					X
10.10(B)#	Form of Stock Option Grant Notice and Stock Option Agreement under the Achaogen, Inc. 2014 Employment Commencement Incentive Plan.	10-K	001-36323	3/16/2015	10.11(B)	
10.10(C)#	Form of Restricted Stock Unit Award Grant Notice and Restricted Stock Unit Award Agreement under the Achaogen, Inc. 2014	10-K	001-36323	3/15/2016	10.10(C)	

	Employment Commencement Incentive Plan.			
10.11#	Change in Control Plan.	S-1	333-193559	1/24/2014 10.14

Exhibit Number	Description of Document	Incorporated by Reference from Registrant's Form	File No.	Date Filed with the SEC	Exhibit Number	Provided Herewith
10.12#	Form of Indemnification Agreement between the registrant and its directors and officers.	S-1/A	333-193559	2/12/2014	10.3	
10.13#	Offer Letter, dated January 24, 2011, by and between the registrant and Kenneth J. Hillan M.B., Ch.B.	S-1	333-193559	1/24/2014	10.10	
10.14#	Offer Letter, dated June 24, 2014, by and between the registrant and Ian Friedland, M.D.	10-Q	001-36323	8/11/2014	10.1	
10.15#	Offer Letter, dated August 12, 2015, between Achaogen, Inc. and Blake Wise.	10-Q	001-36323	11/5/2015	10.5	
10.16#	Offer Letter, dated May 13, 2014, between Achaogen, Inc. and Zeryn Sarpangal.	10-K	001-36323	3/15/2016	10.16	
10.17#	Offer Letter, dated May 3, 2016, by and between Achaogen, Inc. and Tobin Schilke	10-Q	001-36323	8/11/2016	10.4	
10.18#	Offer Letter, dated October 19, 2016, between Achaogen, Inc. and Gary Loeb.					X
10.20#	Form of Change in Control Severance Agreement					X
10.21	Loan and Security Agreement, dated August 5, 2015, by and between Achaogen, Inc. and Solar Capital Ltd.	10-Q	001-36323	8/10/2015	10.3	
10.22	Success Fee Agreement, dated August 5, 2015, by and between Achaogen, Inc. and Solar Capital Ltd.	10-Q	001-36323	8/10/2015	10.4	
10.23	Registration Rights Agreement, dated June 1, 2016, by and among Achaogen, Inc. and the investors signatory thereto.	S-3	333-212253	6/24/2016	99.1	
10.24	Securities Purchase Agreement, dated June 1, 2016, by and among Achaogen, Inc. and the purchasers named therein.	10-Q	001-36323	8/11/2016	10.1	
12.1	Statement Regarding the Computation of Ratio of Earnings to Fixed Charges.					X
23.1	Consent of Ernst & Young 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					X

	1934, as amended.	
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

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Exhibit Number	Description of Document	Incorporated by Reference from Registrant's Form	File No.	Date Filed with the SEC	Exhibit Number	Provided Herewith
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

† Confidential treatment has been granted for certain information contained in this exhibit. Such information has been omitted and filed separately with the SEC.

# Indicates management contract or compensatory plan.

* The certification attached as Exhibit 32.1 that accompanies this Annual Report on Form 10-K is not deemed filed with the SEC and is not to be incorporated by reference into any filing of Achaogen, 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 Form 10-K, irrespective of any general incorporation language contained in such filing.