Axovant Sciences Ltd.
Form 10-K
June 11, 2018
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UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549

FORM 10-K

(Mark One)

ý ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934
For the fiscal year ended March 31, 2018
or
o 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 001-37418

Axovant Sciences Ltd.
(Exact name of registrant as specified in its charter)

Bermuda	98-1333697
(State or other jurisdiction of incorporation or organization)	(I.R.S. Employer Identification No.)
Suite 1, 3rd Floor 11-12 St. James's Square London SW1Y 4LB, United Kingdom	Not Applicable
(Address of principal executive offices)	(Zip Code)

Registrant’s telephone number, including area code: +44 203 318 9708

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

Title of each Class	Name of each exchange on which registered
Common Shares, $0.00001 par value	The Nasdaq Global Select Market

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

Indicate by check mark whether the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. Yes o No ý
Indicate by check mark whether the registrant is not required to file reports pursuant to Section 13 or 15(d) of the Act. Yes o No ý

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 ý No o
Indicate by check mark whether the registrant has submitted electronically and posted on its corporate Web site, if any, every Interactive Data File required to be submitted and posted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit and post such files). Yes ý No o
Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K 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. ý

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Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a smaller reporting company, or an emerging growth company. See the definitions of “large accelerated filer”, “accelerated filer”, “smaller reporting company” and “emerging growth company” in Rule 12b-2 of the Exchange Act. (Check one):
Large accelerated filer o Accelerated filer ý
Non-accelerated filer o (Do not check if a smaller reporting company) Smaller reporting company o
Emerging growth company ý
If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 7(a)(2)(B) of the Securities Act. ý

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act). Yes o No ý
The aggregate market value of voting common shares held by non-affiliates of the registrant on second fiscal quarter ended September 30, 2017 was approximately $220,577,004 based on the last reported sale price of the common shares on The Nasdaq Global Select Market on September 30, 2017 of $6.88 per share.
The number of the Registrant’s common shares, $0.00001 par value per share, outstanding on June 7, 2018 was 107,788,074.

DOCUMENTS INCORPORATED BY REFERENCE
The registrant intends to file a proxy statement (the ‘‘2018 Proxy Statement’’) pursuant to Regulation 14A under the Securities Exchange Act of 1934, as amended, within 120 days of the end of the fiscal year ended March 31, 2018. With the exception of the portions of the 2018 Proxy Statement expressly incorporated into this Annual Report on Form 10-K by reference, such document shall not be deemed filed as part of this Annual Report on Form 10-K. Portions of the proxy statement are incorporated herein by reference into the following parts of this Annual Report on Form 10-K:
Part III, Item 10. Directors, Executive Officers and Corporate Governance;
Part III, Item 11. Executive Compensation;
Part III, Item 12. Security Ownership of Certain Beneficial Owners and Management and Related Shareholder Matters;
Part III, Item 13. Certain Relationships and Related Transactions, and Director Independence; and
Part III, Item 14. Principal Accounting Fees and Services.

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AXOVANT SCIENCES LTD.

ANNUAL REPORT ON FORM 10-K
FOR THE FISCAL YEAR ENDED MARCH 31, 2018

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PART I.

Cautionary Note Regarding Forward-Looking Statements

This Annual Report on Form 10-K contains "forward-looking statements" within the meaning of Section 27A of the Securities Act of 1933, as amended (the "Securities Act") and Section 21E of the Securities Exchange Act of 1934, as amended (the "Exchange Act"). These statements are often identified by the use of words such as "anticipate," "believe," "continue," "could," "estimate," "expect," "intend," "may," "plan," "project," "will," "would" or the negative or plural of these similar expressions or variations, although not all forward-looking statements contain these identifying words. We cannot assure you that the events and circumstances reflected in the forward-looking statements will be achieved or occur and actual results could differ materially from those projected in the forward-looking statements.

The forward-looking statements appearing in a number of places throughout this Annual Report on Form 10-K include, but are not limited to, statements regarding our intentions, beliefs, projections, outlook, analyses or current expectations concerning, among other things:

- the success and timing of our ongoing development and commercialization of AXO-Lenti-PD, nelotanserin and RVT-104;
- our ability to identify and in-license or acquire additional product candidates;
- our relationship under our license agreement with Oxford BioMedica (UK) Ltd.;
- the success of our interactions with international regulatory authorities;
- the anticipated start dates, durations and completion dates of our ongoing and future nonclinical studies and clinical trials;
- the anticipated designs of our future clinical studies;
- anticipated future regulatory submissions and the timing of, and our ability to, obtain and maintain regulatory approvals for our product candidates;
- the rate and degree of market acceptance and clinical utility of any approved product candidate;
- our commercialization, marketing and manufacturing capabilities and strategy;
- continued service of our key scientific or management personnel;
- our ability to obtain, maintain and enforce intellectual property rights for our product candidates;
- our anticipated future cash position;
- our estimates regarding our results of operations, financial condition, liquidity, capital requirements, prospects, growth and strategies;
- the success of competing drugs that are or may become available; and
- our stated objective of becoming the leading biopharmaceutical company focused on neurology and psychiatry.

We have based these forward-looking statements largely on our current expectations and projections about future events, including the responses we expect from the U.S. Food and Drug Administration ("FDA") and other regulatory authorities and financial trends that we believe may affect our financial condition, results of operations, business strategy, nonclinical studies and clinical trials and financial needs. Such forward-looking statements are subject to a number of risks, uncertainties, assumptions and other factors known and unknown that could cause actual results and the timing of certain events to differ materially from future results expressed or implied by the forward-looking statements. Factors that could cause or contribute to such differences include, but are not limited to, those identified herein, and those discussed in the section titled "Risk Factors" set forth in Part I, Item 1A of this Annual Report on Form 10-K and in our other filings with the U.S. Securities Exchange Commission ("SEC"). These risks are not exhaustive. You should not rely upon forward-looking statements as predictions of future events. Furthermore, such forward-looking statements speak only as of the date of this report. New risk factors emerge from time to time and it is not possible for our management to predict all risk factors, nor can we assess the impact of all factors on our business or the extent to which any factor, or combination of factors, may cause actual results to differ materially from those contained in any forward-looking statements. Except as required by law, we undertake no obligation to update any forward-looking statements to reflect events or circumstances after the date of such statements.

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All brand names or trademarks appearing in this report are the property of their respective owners. Unless the context otherwise requires, references in this report to "Axovant," the "Company," "we," "us," and "our" refer to Axovant Sciences Ltd and its subsidiaries.

Item 1. Business

General

Overview

We are a clinical-stage biopharmaceutical company focused on the acquisition, development and commercialization of novel therapeutics in the fields of neurology and psychiatry. We are developing a pipeline of clinical and nonclinical product candidates that focuses on the various aspects of debilitating neurodegenerative diseases such as Parkinson's disease, Alzheimer's disease, Lewy body dementia, and other indications in the fields of neurology and psychiatry. Our goal is to be the leading biopharmaceutical company focused on the fields of neurology and psychiatry.

Our near-term focus is to develop our gene therapy product candidate, AXO-Lenti-PD, as a one-time treatment for Parkinson's disease. We intend to begin a Phase 1/2 study of AXO-Lenti-PD in advanced Parkinson's disease patients before the end of 2018. Prior to the recent in-licensing of AXO-Lenti-PD in June 2018, our primary focus had been on developing nelotanserin, a selective inverse agonist of the 5-HT_{2A} receptor, and intepirdine, an antagonist of the 5-HT_6 receptor. In January 2018, we announced the results of a pilot Phase 2 study of nelotanserin in patients with Lewy body dementia ("LBD") that experience visual hallucinations. We plan to make a determination of the overall development strategy for nelotanserin once we have reviewed topline data in the second half of 2018 from our currently ongoing Phase 2 study of nelotanserin in REM Sleep Behavior Disorder ("RBD") and have completed our ongoing comprehensive clinical, regulatory and commercial review. In addition, we will determine our development plans for RVT-104, a combination of rivastigmine and a peripheral muscarinic receptor antagonist, as a potential treatment for patients with Alzheimer's disease or dementia with Lewy bodies ("DLB"), once we have completed our ongoing comprehensive clinical, regulatory and commercial review in the context of our recent acquisition of AXO-Lenti-PD and any newly acquired assets.

In January 2018, we announced the discontinuation of our development of intepirdine following our announcement that neither the Phase 2b HEADWAY clinical trial of intepirdine in patients with DLB nor the pilot Phase 2 Gait and Balance clinical trial of intepirdine in patients with dementia and gait impairment met their respective primary endpoints, and the September 2017 announcement that our Phase 3 MINDSET clinical trial of intepirdine in patients with mild-to-moderate Alzheimer's disease did not meet its co-primary efficacy endpoints. Following the announcement of Phase 3 MINDSET clinical trial results, we also discontinued further development of RVT-103 which had been intended for use in combination with intepirdine. We remain committed to identifying, developing and commercializing other novel treatments for unmet needs in neurology and psychiatry. We are continuing to actively explore opportunities to acquire or in-license additional products, product candidates and technologies to further build our pipeline.

AXO-Lenti-PD

Overview

AXO-Lenti-PD (previously known as OXB-102) is an in vivo lentiviral gene therapy investigational product candidate currently being developed for the one-time treatment of Parkinson's disease. We licensed the worldwide development and commercialization rights to AXO-Lenti-PD and its predecessor product ProSavin, from Oxford BioMedica (UK) Ltd. ("Oxford BioMedica"), under an exclusive license agreement (the "Oxford BioMedica Agreement") entered into in June 2018.

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AXO-Lenti-PD delivers a construct of three genes that encode the critical enzymes required for the biochemical synthesis of endogenous dopamine from tyrosine. The three enzymes are: Tyrosine Hydroxylase ("TH", the enzyme that converts tyrosine to L-dopa), Cyclohydrolase 1 ("CH1", the rate-limiting enzyme for synthesis of Tetrahydrobiopterin ("BH4"), a critical cofactor for production of L-dopa), and Aromatic L-Amino Acid Decarboxylase ("AADC", the enzyme that converts L-dopa to dopamine). AXO-Lenti-PD is delivered by a one-time MRI-guided stereotactic infusion into the putamen. We believe that delivery of all three of these genes will enable the continuous, tonic, endogenous synthesis of dopamine in non-dopaminergic cells. Dopamine deficiency plays a central role in Parkinson's disease and we believe that restoring dopamine synthesis capability in patients will offer lasting improvement in the symptoms of Parkinson's disease. Oxford BioMedica previously conducted a Phase 1/2 clinical study with ProSavin (also known as OXB-101), an earlier version of this product candidate. In this clinical trial, ProSavin was observed to have a favorable long-term safety profile and demonstrated effects on motor function, supporting proof-of-concept. AXO-Lenti-PD delivers an optimized transgene construct relative to ProSavin.
Theoretical Benefit of AXO-Lenti PD on Dopamine Concentrations Based on Postulated Mechanism of Action

Parkinson's Disease Overview
Parkinson's disease is a chronic neurodegenerative disorder that primarily results in progressive and debilitating motor symptoms. It is estimated that up to 1,000,000 people in the United States and 7,000,000 to 10,000,000 people worldwide suffer from Parkinson's disease. It typically develops between the ages of 55 and 65 years and affects approximately 1% of people over 60 years of age. The underlying factors that result in the development of Parkinson's disease are largely unknown. However, Parkinson's disease is a neurodegenerative disease that results in reduced levels of the neurotransmitter dopamine in the striatum, a region in the brain. Dopamine is essential for movement, and low levels of dopamine in patients with Parkinson's disease are believed to result in the typical motor symptoms of the disease, including hypo- and bradykinesia, rigidity, tremor, and postural instability.
The treatment of Parkinson's disease is currently limited to symptomatic treatments, as no therapies have proven effective in altering the course of the disease or addressing the underlying pathophysiological processes. The mainstay of treatment typically involves the daily administration of oral L-dopa, the precursor to dopamine. While L-dopa is effective in controlling motor symptoms early in the disease, progressive loss of dopaminergic neurons and chronic L-dopa therapy are believed to contribute to the "wearing off' of L-dopa's efficacy in the more advanced stages of the disease. Patients become increasingly less responsive to oral L-dopa therapy and require higher doses to manage their symptoms. More advanced Parkinson's disease patients often begin to experience 'on-off' motor fluctuations, characterized by unpredictable 'OFF periods' of reduced mobility and increased rigidity and tremor. In addition, abnormal and involuntary movements known as dyskinesias may occur at higher L-dopa blood levels. Approximately 10% of patients per year develop 'on-off' motor fluctuations after starting L-dopa therapy.

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As Parkinson's disease progresses, other therapies can be given in combination with L-dopa and include dopamine receptor agonists and inhibitors of enzymes related to dopamine metabolism, such as monoamine oxidase B (MAO-B) and catechol O-methyl transferase (COMT). These therapies aim to further improve overall dopaminergic function. Patient-friendly treatment options for motor fluctuations in advanced Parkinson's disease are limited. Subcutaneous injections of the dopamine agonist apomorphine are used for the acute treatment of OFF episodes. Duopa/Duodopa is an enteral suspension of L-dopa and the peripheral AADC inhibitor carbidopa that is continuously administered over the course of the day through a surgically-placed percutaneous endoscopic gastrostomy with jejunal tube ("PEG-J") to reduce fluctuations in L-dopa blood levels. Deep-Brain Stimulation ("DBS"), a procedure in which electrodes are surgically placed in the basal ganglia, either in the subthalamic nucleus or internal globus pallidus, is another option in advanced Parkinson's disease. Through an impulse generator, electrical stimuli are delivered to the brain to modulate neural signals within these target regions. It remains unclear exactly how DBS improves the symptoms of Parkinson's disease. Both Duopa/Duodopa and DBS require indwelling hardware - a PEG-J tube, or electrodes, leads, and impulse generator - respectively.

Predecessor Product: ProSavin (OXB-101)

ProSavin, the predecessor therapy to AXO-Lenti-PD, delivered the same three genes (AADC, TH, and CH1) as AXO-Lenti-PD in the same lentiviral vector, but in a different payload configuration. AXO-Lenti-PD was the result of multifactorial experimentation to modify the payload configuration to improve endogenous dopamine production. The initial Phase 1/2 clinical trial of ProSavin was completed in 2012 and long-term follow-up is ongoing.

Nonclinical Studies for ProSavin

Nonclinical studies in non-human primate models of Parkinson's disease demonstrated that ProSavin can safely restore striatal dopamine production to approximately 50% and correct motor deficits without associated dyskinesias (p-value <0.05). ProSavin was observed to improve Parkinson's disease symptoms and clinical disease severity in the same non-human primate model, with a durable response seen up to 12 months (p-value < 0.05 at all time points beyond week 4). One of the ProSavin treated non-human primates was continued on the study and exhibited a sustained motor improvement until the study was concluded at 44 months. Nonclinical study data did not reveal adverse reactions nor findings with potential impact on patient safety and provided pertinent data on the optimal method of delivery in the clinic. ProSavin was also observed to be well tolerated when co-administered with L-dopa and apomorphine, indicating that it can be used in conjunction with these commonly used Parkinson's disease medications.

Behavioral Response and Dopamine Production Following Administration of ProSavin in Non-Human Primates

In summary, these experiments were determined to demonstrate the long-term safety of therapeutic doses of ProSavin as well as significant efficacy to improve measures of movement and reduce dyskinesias in multiple animal models. These results supported the initiation of clinical trials for ProSavin.

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Phase 1/2 Clinical Trial of ProSavin

ProSavin was evaluated for safety and efficacy in a Phase 1/2 study in patients with advanced Parkinson's disease by Oxford BioMedica. In this study, ProSavin was observed to be safe and well-tolerated with sustained improvements on motor function as measured by the Unified Parkinson's Disease Rating Scale ("UPDRS") Part III (motor) score in the state "OFF" levodopa medication ("UPDRS Part III "OFF""). The Phase 1/2 clinical trial was conducted at sites in the United Kingdom and France on a total of 15 patients with advanced Parkinson's disease. Three dose levels of ProSavin were assessed in four patient cohorts: dose level one (1.9×10^7 transducing units ("TU"); cohort 1); dose level two (4.0×10^7 TU; cohorts 2a and 2b); and dose level three (1×10^8 TU; cohort 3). Cohorts 2b and 3 underwent a modified delivery method to increase the rate of delivery of the viral vector. The primary endpoints were the number and severity of adverse events as well as the UPDRS Part III "OFF" scores at 6 months after gene therapy administration. No serious adverse events related to ProSavin or the surgical procedure were reported. Reported adverse events ("AEs") were generally mild and related to either Parkinson's disease progression or L-dopa-induced dyskinesias that were ameliorated with reduction of L-dopa administration. The most common AEs in the first 12 months were dyskinesia (n=11 subjects), "on-off" motor fluctuations (n=9), headache (n=4), and akinesia (n=3).

Across all patients, mean UPDRS Part III "OFF" scores were significantly improved at six months (33% reduction, p-value=0.0001) and 12 months (31% reduction, p-value=0.0001). Sustained improvement was seen through four years of follow-up and the long-term follow-up study is still ongoing (10 years exposure in the earliest subject). This clinical data was published in The Lancet in 2014.

Mean change in UPDRS Part III "OFF" score results after 12 months from the Phase 1/2 ProSavin Trial

Second-Generation Product Candidate: AXO-Lenti-PD

AXO-Lenti-PD is a re-engineered gene therapy product candidate that was selected following multifactorial experimentation to modify the payload configuration of ProSavin to further improve dopamine production. The modifications included a different ordering of the genes, the fusion of TH and CH1 with a flexible linker, and the removal of a genetic control element between TH and AADC. We believe these changes lead to more balanced stoichiometry of gene expression and colocalization of enzymatic activity. The targeted net result is improved dopamine production in transfected cells.

Nonclinical studies for AXO-Lenti-PD

In vitro experiments with AXO-Lenti-PD demonstrated up to 10-fold increases in dopamine + L-dopa production over ProSavin. Functionally, in non-human primate models, AXO-Lenti-PD demonstrated a similar level of improvement in spontaneous locomotor activity compared to ProSavin at approximately $1/5^{th}$ the dose. We believe these data demonstrate that AXO-Lenti-PD has greater potency compared to ProSavin in terms of dopamine production, enzymatic activity and functional improvement in animal models of Parkinson's disease.

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Comparison of Catecholamine (L-dopa and Dopamine) Production Between ProSavin and AXO-Lenti-PD in Primary Human Cortical Neurons

Planned Phase 1/2 Clinical Study of AXO-Lenti-PD

We plan to initiate a Phase 1/2 clinical study of AXO-Lenti-PD in patients with advanced Parkinson's disease before the end of 2018. The planned study design consists of two parts:

- Part A is a non-randomized dose-escalation of multiple potential dose levels
- Part B is a double-blind design with patients randomized either to an active group receiving the optimal dose as determined in Part A, or a control group receiving an imitation "sham" surgical procedure

The study will evaluate the safety and tolerability of AXO-Lenti-PD as well as effects on biomarkers and clinical measures of motor function, including as measured by the UPDRS Part III. Sufficient gene therapy product is currently available to complete the planned Phase 1/2 clinical study.

Flow Diagram of Planned Phase 1/2 Clinical Trial of AXO-Lenti-PD

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Nelotanserin

Overview

In October 2015, we acquired from our majority shareholder, Roivant Sciences Ltd. ("RSL"), the global rights to nelotanserin, a selective inverse agonist of the 5-HT_{2A} receptor. To date, we have been investigating and developing nelotanserin to address visual hallucinations and REM sleep behavior disorder ("RBD") in patients with LBD. In June 2017, we received Fast Track designation from the FDA for nelotanserin for the treatment of visual hallucinations in DLB.

Mechanism of Action

Nelotanserin reduces the activity of the 5-HT_{2A} receptor. The 5-HT_{2A} receptor has been linked to neuropsychiatric disturbances including visual hallucinations and sleep disturbances and the antagonism of 5-HT_{2A} receptors has been shown to improve parkinsonism. In in vitro studies, nelotanserin did not antagonize the dopamine D_2 receptor. Antagonism of the D_2 receptor in LBD patients can lead to severe side effects including increased parkinsonism, worsening of cognition, heavy sedation, and symptoms resembling neuroleptic malignant syndrome, which can be fatal.

Nelotanserin in Lewy Body Dementia

Medical Need

LBD includes two similar conditions, DLB and Parkinson's disease dementia ("PDD"). There is significant overlap in the pathology and clinical presentation of both conditions; however, the primary difference generally depends on the timing of the onset of cognitive decline relative to the onset of movement-related symptoms. LBD is a progressive neurodegenerative disorder pathologically characterized by the aggregation of alpha-synuclein and other proteins, known as Lewy bodies, in the brain, causing disruption in cognition, function and behavior. In DLB, the cognitive decline typically occurs before or within one year of the onset of movement disorder symptoms. In PDD, movement disorder symptoms typically precede cognitive decline by more than one year. The Lewy Body Dementia Association estimates that there are 1.4 million patients with LBD in the United States.

LBD patients suffer from frequent visual hallucinations, which are often treated with off-label atypical antipsychotic medications, such as quetiapine. Use of atypical antipsychotic medications, which have activity against the dopamine D_2 receptor, can lead to increased or possibly irreversible parkinsonism in LBD patients and a life-threatening side-effect resembling neuroleptic malignant syndrome. We believe that there is a need for new therapeutic options that can reduce visual hallucinations in LBD patients without risk of these severe side effects.

Parkinsonism is a core feature of LBD, which includes patients diagnosed with both PDD and DLB. Dopaminergic agents (such as L-Dopa and dopamine agonists), which are commonly used for the treatment of Parkinson's disease, can exacerbate neuropsychiatric symptoms in patients diagnosed with LBD. We believe that there is a need for new therapeutic options for LBD patients that can reduce the burden of motor symptoms without increasing the risk of neuropsychiatric side-effects.

Clinical Development

In January 2018, we reported results for a pilot Phase 2 Visual Hallucination study of nelotanserin in patients with LBD. On the primary endpoint of safety, including an assessment of symptoms as measured by the UPDRS, nelotanserin was generally well tolerated. A number of exploratory efficacy assessments were conducted, including the UPDRS Part III; the Scale for the Assessment of Positive Symptoms (SAPS); SAPS-PD; the Patient Global Impression of Change of Visual Hallucinations (PGIC-VH); and an internally developed patient diary. In a prespecified intention-to-treat analysis, nelotanserin treatment versus placebo (n=27) resulted in a 3.12 point improvement in the UPDRS Part III with a positive trend (p=0.075, unadjusted). In a prespecified analysis of the DLB patient subset (n=19), nelotanserin improved the UPDRS Part III by 4.00 points (p=0.041, unadjusted). No other statistical trends of improvement were seen on prespecified analyses of the full SAPS, SAPS-PD, PGIC-VH, or in the patient diary. We plan to make a determination of the overall development strategy for nelotanserin once the results from the Phase 2 RBD study of nelotanserin are received in the second half of 2018 and after we complete our ongoing comprehensive clinical, regulatory and commercial review in the context of any newly acquired product candidates.

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Nelotanserin for REM Sleep Behavior Disorder in Lewy Body Dementia

Medical Need

RBD is a common clinical feature of LBD, and is a condition where patients lose normal sleep paralysis resulting in the physical acting out of their dreams, impacting their quality of life and endangering themselves and their bed partners. While off-label treatment of RBD with benzodiazepines is common, this class of drugs is associated with severe side effects in patients with dementia, including sedation, worsening of cognition and increased risk of falls. We believe that there is a need for new therapeutic options that can reduce the frequency of RBD without sedating patients or worsening cognition in patients with dementia.

Clinical Development

In March 2016, we initiated a four-week, double-blind, randomized, placebo-controlled Phase 2 study in patients with DLB and Parkinson's disease dementia suffering from RBD. This study will utilize objective measures of efficacy as assessed in a sleep-lab setting. Due to challenges with recruitment for this study, we elected to close enrollment prior to reaching our enrollment target. Because of this smaller than planned enrollment, the study may not qualify as pivotal. We expect to receive top-line results for this study in the second half of calendar year 2018. Patients completing the double-blind portion of this study are eligible to enroll in an open label extension study of nelotanserin.

RVT-104

Overview

In August 2016, we and Qaam Pharmaceuticals LLC (“Qaam”) entered into an exclusive license agreement under which we in-licensed the rights to develop and commercialize RVT-104, a product candidate that combines rivastigmine, a cholinesterase inhibitor, with a peripherally acting quaternary amine muscarinic receptor antagonist. This combination could provide a means to mitigate the known peripheral side effects of cholinesterase inhibitors and may also allow higher than currently approved doses of cholinesterase inhibitors such as rivastigmine, which may improve treatment of symptoms of neurodegenerative disorders such as Alzheimer’s disease and DLB.

Mechanism of Action of RVT-104

Cholinesterase inhibitors are dose-limited by their gastrointestinal tolerability profile, which limits patient adoption and compliance. Peripherally-acting muscarinic receptor antagonists in combination with cholinesterase inhibitors may reduce the gastrointestinal side effects of cholinesterase inhibitors and may also potentially allow higher than currently approved doses of cholinesterase inhibitors to be used.

RVT-104 is the combination of high-dose rivastigmine and a peripherally-acting quaternary amine muscarinic receptor antagonist. Rivastigmine has shown greater efficacy at higher-than approved doses that were not well tolerated. Unlike donepezil, which only inhibits the acetylcholinesterase enzyme, rivastigmine also inhibits the butyrylcholinesterase enzyme, which is also involved in the breakdown of acetylcholine. Thus, there is reason to believe that higher doses of rivastigmine could potentially lead to better efficacy because, in addition to blocking acetylcholinesterase, the activity of butyrylcholinesterase is also addressed.

RVT-104 in Alzheimer's Disease and Dementia with Lewy Bodies

Cholinesterase inhibitors are the standard of care in both Alzheimer’s disease and DLB. Despite their widespread use, many patients cannot tolerate the cholinesterase inhibitors because of their cholinergic side effects such as nausea, vomiting and diarrhea. We believe that drugs that can mitigate these cholinergic side effects will allow more patients to receive optimal cholinesterase inhibitor therapy as well as potentially allow for dosing with higher than currently approved doses. We are exploring RVT-104, a combination of rivastigmine and a peripheral muscarinic receptor antagonist, as a potential treatment for patients with Alzheimer's disease or DLB. We anticipate making a decision about development plans for this program after an internal portfolio review in the context of any newly acquired product candidates.

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Discontinuation of Intepirdine and RVT-103

Intepirdine

We acquired the worldwide rights to intepirdine from Glaxo Group Limited and GlaxoSmithKline Intellectual Property Development Limited, collectively GSK, under an asset purchase agreement entered into in December 2014 ("the GSK Agreement"). In September 2017, we announced top-line results from the Phase 3 MINDSET trial. At 24 weeks, patients treated with 35 mg of intepirdine did not experience improvement in cognition or in measures of activities of daily living as measured by the Alzheimer's Disease Assessment Scale-Cognitive Subscale (ADAS-Cog) and by the Alzheimer's Disease Cooperative Study-Activities of Daily Living scale (ADCS-ADL), respectively, compared to patients treated with placebo. In January 2018, we announced results for the Phase 2b HEADWAY trial of intepirdine in patients with DLB and the pilot Phase 2 Gait and Balance trial in patients with dementia and gait impairment. In each of these trials, while intepirdine was generally well tolerated, it did not meet its primary efficacy endpoints. In light of the data from these trials, we have discontinued any further development of intepirdine.

RVT-103

In August 2016, we and Qaam entered into an exclusive license agreement under which we in-licensed the rights to develop and commercialize RVT-103. Following the announcement of Phase 3 MINDSET clinical trial results, we also discontinued further development of RVT-103 which had been intended for use in combination with intepirdine.

Our Key Agreements

Oxford BioMedica License Agreement for AXO-Lenti-PD

On June 5, 2018, we, through our wholly-owned subsidiary, Axovant Sciences GmbH ("ASG"), entered into the Oxford BioMedica Agreement. Pursuant to the Oxford BioMedica Agreement, we received from Oxford BioMedica a worldwide, exclusive, royalty-bearing, sub-licensable license under certain patents and other intellectual property controlled by Oxford BioMedica to develop and commercialize AXO-Lenti-PD and related gene therapy products (collectively, the "Gene Therapy Products") for all diseases and conditions. Our license includes a right of reference to regulatory materials controlled by Oxford BioMedica related to the Gene Therapy Products. We also received from Oxford BioMedica an exclusive option to obtain a worldwide license to other patents and know-how controlled by Oxford BioMedica related to certain technology processes. Under the terms of the Oxford BioMedica Agreement, we and Oxford BioMedica have each agreed to customary non-compete restrictions limiting our respective abilities to develop certain directly-competing gene therapy products.

Pursuant to the Oxford BioMedica Agreement, the parties will establish a clinical project team, a process development team and a scientific advisory board. The clinical project team will oversee the transition of the long-term follow-up study of ProSavin and the AXO-Lenti-PD clinical program. Additionally, Oxford BioMedica will provide us with the equivalent of up to six full-time employees to assist with the conduct of these clinical programs, and we will reimburse Oxford BioMedica for costs related to such individuals.

The process development project team will oversee certain process development services that Oxford BioMedica will perform for us with respect to the manufacture of the Gene Therapy Products. The scientific advisory board will enable Oxford BioMedica to advise with respect to certain clinical and scientific aspects of the development of the Gene Therapy Products.

We are solely responsible, at our expense, for all activities related to the development and commercialization of the Gene Therapy Products. Pursuant to the Oxford BioMedica Agreement, we are required to use commercially reasonable efforts to develop, obtain regulatory approval of, and commercialize a Gene Therapy Product in the United States and at least one major market country in Europe. In addition, we are required to meet certain diligence milestones and to include at least one U.S.-based clinical trial site in a pivotal study of a Gene Therapy Product. If we fail to meet any of these specified development milestones, we may cure such failure by paying Oxford BioMedica certain fees, which range from $0.5 million to $1.0 million.

The Oxford BioMedica Agreement provides that Oxford BioMedica will transfer its existing inventory of AXO-Lenti-PD to us, which we intend to use in our planned Phase 1/2 study. Oxford BioMedica will manufacture and supply the Gene Therapy Products to us in accordance with separate clinical and commercial supply agreements that will be negotiated by the parties. Pursuant to the Oxford BioMedica Agreement, such clinical and commercial supply agreements will contain certain key provisions as set forth in the Oxford BioMedica Agreement, including the pricing

structure and our ability to transfer the technology to another manufacturer at any time following the completion of formal process characterization, process validation or Biologics License Application ("BLA") submission.

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As partial consideration for the license, we will make an upfront payment to Oxford BioMedica of $30.0 million, $5.0 million of which will be applied as a credit against the process development work and clinical supply that Oxford BioMedica will provide to us. Under the terms of the Oxford BioMedica Agreement, we could be obligated to make payments to Oxford BioMedica totaling up to $55.0 million upon the achievement of specified development milestones and $757.5 million upon the achievement of specified regulatory and sales milestones. We will also be obligated to pay Oxford BioMedica a tiered royalty from 7% to 10%, based on yearly aggregate net sales of the Gene Therapy Products, subject to specified reductions upon the occurrence of certain events as set forth in the Oxford BioMedica Agreement. These royalties are required to be paid, on a product-by-product and country-by-country basis, until the latest to occur of the expiration of the last to expire valid claim of a licensed patent covering such product in such country, the expiration of regulatory exclusivity for such product in such country, or 10 years after the first commercial sale of such product in such country.

Oxford BioMedica will continue to be responsible for the prosecution, maintenance, and enforcement of the licensed patents that relate to the Gene Therapy Products at their expense, but we have the right to take over any prosecution, maintenance, and enforcement of licensed patents that are solely and specifically related to the Gene Therapy Products if Oxford BioMedica fails to act.

The Oxford BioMedica Agreement will expire on a product-by-product and country-by-country basis upon the expiration of the royalty payment term described above for such product in such country. We may terminate the Oxford BioMedica Agreement at any time for any reason with prior written notice to Oxford BioMedica. Either party may terminate the Oxford BioMedica Agreement for the other party's uncured material breach of the Oxford BioMedica Agreement or insolvency.

If the Oxford BioMedica Agreement is terminated in its entirety, all rights and licenses granted to us cease and we must transfer all regulatory filings and know-how related to the Gene Therapy Products to Oxford BioMedica. Oxford BioMedica will reimburse us for the costs associated with such transfer. Upon termination of the Oxford BioMedica Agreement, we must also grant Oxford BioMedica an exclusive license under all patents that cover the Gene Therapy Products and related know-how that we or our affiliates or sublicensees control. We may sell off any existing inventory of Gene Therapy Products for a specified period after termination.

Arena Development Agreement for Nelotanserin

In October 2015, we exercised an option to acquire global rights, title, interest and obligations in and to nelotanserin from our majority shareholder RSL. In May 2015, RSL entered into a development, marketing and supply agreement for nelotanserin (the "Arena Development Agreement") with Arena Pharmaceuticals, GmbH ("Arena") and we entered into a Waiver and Option Agreement with RSL. Upon the exercise of our option, we assumed RSL's rights and obligations under the Arena Development Agreement, as amended October 18, 2017. In January 2018, we were notified by Arena that it has assigned all of its rights and obligations under the Arena Development Agreement to an affiliate, 125 Royalty Inc. Under the Waiver and Option Agreement, we recorded $5.3 million as research and development expense which was 110% of any payments made to Arena by RSL, and any costs incurred by RSL in connection with the development of nelotanserin. We will be responsible for future contingent payments under the Arena Development Agreement, including up to $4.0 million in potential development milestone payments, up to $37.5 million in potential regulatory milestone payments and up to $60.0 million in potential commercial milestone payments. Under the Arena Development Agreement, we are also obligated to purchase all commercial supplies of nelotanserin from Arena for a fixed price equal to 15% of net sales of nelotanserin.

The Arena Development Agreement will remain in effect until terminated: (1) by the parties' mutual agreement; (2) for any reason by us upon 90 days' written notice to Arena; (3) by either party upon written notice for the other party's material breach or insolvency event if such party fails to cure such breach or the insolvency event is not dismissed within the specified cure period; or (4) by Arena if we or our affiliates participate in a challenge to certain Arena patents.

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Services Agreements with Roivant Sciences, Inc. and Roivant Sciences GmbH

In October 2014, we and our wholly-owned subsidiary, Axovant Sciences, Inc. (“ASI”), entered into a services agreement with Roivant Sciences, Inc. (“RSI”), a wholly-owned subsidiary of RSL, pursuant to which RSI provides us with services in relation to the identification of potential product candidates and project management of clinical trials, as well as other services related to our development, administrative and financial functions. In February 2017, in connection with the contribution and assignment of all of our intellectual property rights to ASG, we amended and restated this services agreement effective as of December 13, 2016, as a result of which ASG was added as a recipient of services from RSI. In addition, ASG also entered into a separate services agreement with Roivant Sciences GmbH (“RSG”), a wholly-owned subsidiary of RSL, effective as of December 13, 2016, for the provision of services by RSG to ASG in relation to the identification of potential product candidates and project management of clinical trials, as well as other services related to development, administrative and financial activities. Under the terms of both services agreements, we are obligated to pay or reimburse RSI and RSG for the costs they, or third parties acting on their behalf, incur in providing services to us or ASG, including administrative and support services as well as research and development services. In addition, we are obligated to pay to RSI and RSG at a pre-determined mark-up on the costs incurred directly by RSI and RSG in connection with any general and administrative and research and development services provided directly by RSI and RSG.

Loan and Security Agreement with Hercules Capital, Inc.

On February 2, 2017, we and our wholly owned subsidiaries, Axovant Holdings Limited (“AHL”), ASG and ASI entered into a loan and security agreement, as amended on May 24, 2017 and September 22, 2017 (the ‘‘Loan Agreement’’), with Hercules Capital, Inc. (“Hercules”), under which we, AHL and ASG, (collectively, the ‘‘Borrowers’’), borrowed an aggregate of $55.0 million (the “Term Loan”). ASI issued a guaranty of the Borrowers’ obligations under the Loan Agreement. At the closing of the Term Loan, the Borrowers paid Hercules a facility charge of $550,000. The Term Loan bears interest at a variable per annum rate calculated for any day as the greater of either (i) the prime rate plus 6.80%, and (ii) 10.55%. The Term Loan has a scheduled maturity date of March 1, 2021. The Borrowers are obligated to make monthly payments of accrued interest under the Loan Agreement until September 1, 2018, followed by monthly installments of principal and interest through March 1, 2021. In connection with the Loan Agreement, the Borrowers and ASI, as guarantor, granted Hercules a first position lien on substantially all of their respective assets, excluding intellectual property. Prepayment of the Term Loan is subject to penalty.

The Loan Agreement includes customary affirmative and restrictive covenants and representations and warranties, including a minimum cash covenant, a covenant against the occurrence of a “change in control,” financial reporting obligations, and certain limitations on the incurrence of indebtedness, liens (including a negative pledge on intellectual property and other assets), investments, distributions (including dividends), collateral, transfers, mergers or acquisitions, taxes, corporate changes, and deposit accounts. The Loan Agreement also includes customary events of default, including payment defaults, breaches of covenants following any applicable cure period, the occurrence of certain events that could reasonably be expected to have a “material adverse effect” as set forth in the Loan Agreement, cross acceleration to the debt and certain events relating to bankruptcy or insolvency. Upon the occurrence of an event of default, a default interest rate of an additional 5.0% may be applied to the outstanding principal balance, and Hercules may declare all outstanding obligations immediately due and payable and take such other actions as set forth in the Loan Agreement.

In addition, for so long as the Term Loan remains outstanding, we are required to use commercially reasonable efforts to afford Hercules the opportunity to participate in future underwritten equity offerings of our common shares up to a total of $3.0 million.

In connection with the entry into the Loan Agreement, we issued a warrant to Hercules which was exercisable for an aggregate of 274,086 of our common shares at an exercise price of $12.04 per share. In August 2017, Hercules exercised the warrant on a cashless basis and received a net issuance of 129,827 of our common shares.

Our Strategy

Our goal is to become the leading biopharmaceutical company focused on neurology and psychiatry.

The key elements of our strategy to achieve this goal include:

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Developing AXO-Lenti-PD for the treatment of advanced Parkinson's disease. In June 2018, we in-licensed AXO-Lenti-PD from Oxford BioMedica. We plan to initiate a Phase 1/2 study of AXO-Lenti-PD before the end of 2018 and will ultimately seek to commercialize this product candidate in the United States and other major markets if approved, potentially through collaborations for non-U.S. markets.

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- Acquiring or in-licensing potentially transformative product candidates for the fields of neurology and psychiatry in a capital-efficient manner. We intend to identify, acquire, develop and commercialize novel product candidates for the fields of neurology and psychiatry. In evaluating product acquisition candidates, we focus on candidates that are in or near clinical-stage development that offer improved solutions to patients and leverage our business infrastructure. In addition, our acquisition strategy has been to acquire global rights for these compounds wherever possible.
- Acquire or in-licensing other CNS-focused gene therapies to leverage our developing capabilities in the gene therapy field with our CNS drug development expertise. We intend to identify, acquire, develop and commercialize other novel CNS-focused gene therapy candidates. These gene therapy candidates may be in the nonclinical stage of development.
- Developing nelotanserin for the treatment of Lewy Body Dementia and related disorders. In January 2018, we reported results for a pilot Phase 2 clinical study of nelotanserin in patients with either DLB or Parkinson's disease dementia who experience frequent visual hallucinations. In March 2016, we initiated a second Phase 2 study of nelotanserin in patients with either DLB or Parkinson's disease dementia suffering from RBD. We plan to make a determination of the overall development strategy for nelotanserin once the RBD data is available in the second half of 2018 and after we complete our ongoing comprehensive clinical, regulatory and commercial review in the context of any newly acquired clinical assets.
- Maximizing the commercial potential of our product candidates. We plan to directly commercialize our product candidates in the United States and the European Union, if approved. In other markets for which commercialization may be less capital efficient for us, we may selectively pursue strategic collaborations with third parties in order to maximize the commercial potential of our product candidates, if approved.

Sales and Marketing

We plan to build our own marketing, sales and distribution capabilities. In order to commercialize our product candidates, if approved for commercial sale, we must either develop a sales and marketing infrastructure or collaborate with third parties that have sales and marketing experience. We plan to directly commercialize our product candidates in the United States and Europe. In other markets for which commercialization may be less capital efficient for us, we may selectively pursue strategic collaborations with third parties in order to maximize the commercial potential of our product candidates.

Manufacturing

We are building teams with gene therapy, drug formulation and manufacturing expertise but do not own or operate facilities for product manufacturing, storage and distribution, or testing.

The Oxford BioMedica Agreement provides that Oxford BioMedica will transfer its existing inventory of AXO-Lenti-PD to us, which we intend to use in our planned Phase 1/2 study. Oxford BioMedica will manufacture and supply the Gene Therapy Products to us in accordance with separate clinical and commercial supply agreements that will be negotiated by the parties. Pursuant to the Oxford BioMedica Agreement, such clinical and commercial supply agreements will contain certain key provisions as set forth in the Oxford BioMedica Agreement, including the pricing structure and our ability to transfer the technology to another manufacturer at any time following the completion of formal process characterization, process validation or BLA submission.

Under the Arena Development Agreement, we are obligated to obtain all commercial supplies of nelotanserin exclusively from Arena, and we are completely dependent upon Arena to manufacture or otherwise procure sufficient quantities of nelotanserin for commercial sale, if nelotanserin is approved. We do not have any right, even if Arena fails to satisfy its supply obligations, to manufacture nelotanserin ourselves or to engage a contract manufacturer to make it for us for commercial sale. In addition to Arena supplying nelotanserin drug product for clinical development activities, we have contracted with third parties to produce nelotanserin drug substance and drug product for use in clinical development.

Manufacturing of any product candidate is subject to extensive regulations that impose various procedural and documentation requirements, which govern recordkeeping, manufacturing processes and controls, personnel, quality control and quality assurance, among others. We expect that Oxford BioMedica will manufacture AXO-Lenti-PD and Arena will manufacture or procure nelotanserin under cGMP. cGMP is a regulatory requirement for the production of pharmaceuticals to be used in humans.

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Competition

We consider our most direct competitor with respect to AXO-Lenti-PD to be Voyager Therapeutics, which is developing VY-AADC, a gene therapy product candidate for the treatment of advanced Parkinson's disease. VY-AADC delivers the AADC gene, one of the three genes contained in AXO-Lenti-PD, via an Adeno-Associated Virus. Voyager anticipates entering a Phase 3 study in mid-2018. Agilis Biotherapeutics is developing AGIL-AADC, another AAV gene therapy that delivers the AADC gene, for the treatment of AADC deficiency, a rare disorder that involves loss of AADC gene function. In addition, DBS (Deep Brain Stimulation) is approved for treating Parkinson's disease and is marketed by multiple device manufacturers, including Medtronic, Abbott and Boston Scientific. DBS treatment involves permanent placement of hardware in the brain via stereotactic neurosurgery and may require follow-up adjustments or even invasive device replacements. Another surgical approach is Abbvie's Duopa which is delivered via a port implanted in the abdominal wall. Further efforts are also underway to develop new improved formulations of L-dopa, including Acorda's Inbrija and Mitsubishi Tanabe's ND0612. Adjunct therapies are also being developed or have recently been approved to supplement L-dopa therapy, including Sunovion's sublingual apopmorphine and Adamas Pharmaceuticals' GoCovri. Several companies are also trying to develop other disease modifying therapies that could prevent the progression of Parkinson's disease. Examples of these early stage efforts include Denali Therapeutics' LRRK2 inhibitors and anti-alpha synuclein antibodies from Prothena/Roche and Biogen, as well as Prevail Therapeutics' pipeline of AAV-based therapeutics targeting lysosomal dysfunction.

We consider our most direct competitor with respect to nelotanserin to be Acadia Pharmaceuticals, which is marketing and developing pimavanserin, a 5-HT_{2A} receptor inverse agonist that received FDA approval in April 2016 for the treatment of hallucinations and delusions associated with Parkinson's disease psychosis. We believe the FDA approval of pimavanserin adds further validation to the therapeutic relevance of 5-HT_{2A} as a potential target for the treatment of visual hallucinations.

In addition to other 5-HT_{2A} receptor inverse agonists in active development, we are aware of many biotechnology and pharmaceutical companies as well as academic institutions, government agencies and private and public research institutions that are developing, and may in the future develop and commercialize, products for Lewy body dementia and other indications in the fields of neurology and psychiatry.

Drug development is highly competitive and subject to rapid and significant technological advancements. Our ability to compete will significantly depend upon our ability to complete necessary clinical trials and regulatory approval processes, and effectively market any drug that we may successfully develop. Our current and potential future competitors include pharmaceutical and biotechnology companies, academic institutions and government agencies. The primary competitive factors that will affect the commercial success of any product candidate for which we may receive marketing approval include efficacy, safety and tolerability profile, dosing convenience, price, coverage and reimbursement. Many of our existing or potential competitors have substantially greater financial, technical and human resources than we do and significantly greater experience in the discovery and development of product candidates, as well as in obtaining regulatory approvals of those product candidates in the United States and in foreign countries. Our current and potential future competitors also have significantly more experience commercializing drugs that have been approved for marketing. Mergers and acquisitions in the pharmaceutical and biotechnology industries could result in even more resources being concentrated among a small number of our competitors.

Accordingly, our competitors may be more successful than us in obtaining regulatory approval for therapies and in achieving widespread market acceptance of their drugs. It is also possible that the development of a cure or more effective treatment method for Parkinson's disease, Alzheimer's disease, Lewy body dementia and other indications in the fields of neurology and psychiatry by a competitor could render our product candidates non-competitive or obsolete or reduce the demand for our product candidates before we can recover our development and commercialization expenses.

Intellectual Property

Our commercial success depends in part on our ability to obtain and maintain proprietary protection for nelotanserin and AXO-Lenti-PD, any of our future product candidates, novel discoveries, product development technologies and other know-how. Our commercial success also depends on our ability to operate without infringing on the proprietary rights of others and our ability to prevent others from infringing our proprietary rights. Our policy is to seek to protect

our proprietary position by, among other methods, filing U.S. and foreign patents and patent applications related to our proprietary technology, inventions and improvements that are important to the development and implementation of our business. We also rely on trademarks, trade secrets, copyrights, know-how, continuing technological innovation and potential in-licensing and acquisition opportunities to develop and maintain our proprietary position.

While we seek broad coverage under our existing patent applications, there is always a risk that an alteration to the process of obtaining patents or changes to the patent law in the United States or elsewhere may provide sufficient basis for a competitor to challenge or avoid infringement of our patents. In addition, patents, if granted, expire and we cannot provide any assurance that any patents will be issued from our pending or any future applications or that any potentially issued patents will adequately protect our intellectual property.

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Individual patents extend for varying periods depending on the date of filing of the patent application or the date of patent issuance and the legal term of patents in the countries in which they are obtained. Generally, patents issued for regularly filed applications in the United States are granted a term of 20 years from the earliest effective filing date. In addition, in certain instances, a patent term can be extended via a Patent Term Adjustment (“PTA’’), to recapture a portion of the U.S. Patent and Trademark Office's (the “USPTO’’) delay in issuing the patent as well as a portion of the term effectively lost as a result of the FDA regulatory review period via a Patent Term Extension (“PTE’’). However, as to the FDA component, the PTE period can be applied to only one patent per approved product, cannot be longer than five years and the total patent term including the PTE period must not exceed 14 years following FDA approval of an NDA. The duration of foreign patents varies in accordance with provisions of applicable local law, but typically is also 20 years from the earliest effective non-provisional filing date. The actual protection afforded by a patent varies on a product by product basis, from country to country and depends upon many factors, including the type of patent, the scope of its coverage, the availability of regulatory-related extensions, the availability of legal remedies in a particular country and the validity and enforceability of the patent. The patent term of a European patent is 20 years from its filing date; however, unlike in the United States, a European patent is not granted PTA for delays at the European Patent Office. However, the European Union does have a compensation program similar to the U.S.’s PTE called Supplementary Patent Certificate (“SPC’’) that would effectively extend patent protection for up to five years on one patent and the total patent term including the SPC must not exceed 15 years following the EMA granting of marketing authorization. Other major markets, including Japan, have similar patent term extension provisions and we intend to seek patent term extensions in those countries that have such programs.

In June 2018, we, through our wholly-owned subsidiary, ASG, entered into the Oxford BioMedica Agreement with Oxford BioMedica. Pursuant to the Oxford BioMedica Agreement, we received from Oxford BioMedica a worldwide, exclusive, royalty-bearing, sub-licensable license under certain patents and other intellectual property controlled by Oxford BioMedica to develop and commercialize the Gene Therapy Products for all diseases and conditions. Oxford BioMedica is prohibited from granting licenses to third parties to develop, commercialize, or distribute such lentiviral-based vector products. The licensed IP includes issued U.S. and foreign patents and pending U.S. and foreign patent applications that cover AXO-Lenti-PD as a composition of matter as well as methods of making and using AXO-Lenti-PD in major markets, including the United States, Japan, China, India, the United Kingdom, Australia, and South Korea. These patents and applications, if issued, are projected to expire starting at the end of 2018, with the last to expire in October of 2032 (not taking into account any PTA, which may be obtained in the future). The initial U.S. composition of matter patent for AXO-Lenti-PD naturally expires in 2023 inclusive of PTA, and we expect a follow-on patent to be issued that will expire in 2032 (not taking into account any PTA, which may be obtained in the future). The term of that follow-on patent may be extended by up to five years with PTE.

In October 2015, we assumed RSL’s rights and obligations under the Arena Development Agreement for nelotanserin. Pursuant to the Arena Development Agreement, we have the exclusive right to commercialize and distribute nelotanserin worldwide. Arena is prohibited from granting licenses to third parties to develop, commercialize, or distribute nelotanserin. We have the exclusive first rights to bring any action with respect to infringement by any third party of the patents covered under the Arena Development Agreement. The patents include issued U.S. and foreign patents and pending patent applications that cover nelotanserin and analogues thereof as a composition of matter as well as methods of use in major markets, including the United States, Japan, China, Germany, France, Italy, the United Kingdom, Spain, Canada, Russia, India, Australia and South Korea, and have applications pending in a number of other jurisdictions. These patents and applications start to expire in 2024. The U.S. composition of matter patent for nelotanserin naturally expires in 2028 inclusive of PTA and the term of this patent may be extended by up to five years with PTE. We also own several pending U.S., corresponding PCT applications and foreign applications directed to uses of nelotanserin alone or in combination with other pharmaceutical agents, which, if granted, would extend the patent life of certain uses of nelotanserin to between 2036 and 2037.

Furthermore, we rely upon trade secrets and know-how and continuing technological innovation to develop and maintain our competitive position. We seek to protect our proprietary information, in part by using confidentiality agreements with our commercial partners, collaborators, employees and consultants and invention assignment agreements with our employees. We also have confidentiality agreements and invention assignment agreements with

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

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Our commercial success will also depend in part on not infringing the proprietary rights of third parties. It is uncertain whether the issuance of any third-party patent would require us to alter our development or commercial strategies, or our drugs or processes, obtain licenses or cease certain activities. Our breach of any license agreements or failure to obtain a license to proprietary rights that we may require to develop or commercialize our future drugs may have an adverse impact on us. If third parties prepare and file patent applications in the United States that also claim technology to which we have rights, we may have to participate in interference or derivation proceedings in the USPTO to determine priority of invention.

Government Regulation

FDA Drug Approval Process

In the United States, pharmaceutical and biological products are subject to extensive regulation by the FDA under the Federal Food, Drug, and Cosmetic Act (“FDCA’’), and the Public Health Service Act (“PHSA’’). The FDCA, PHSA, and other federal and state statutes and regulations, govern, among other things, the research, development, testing, manufacture, storage, recordkeeping, approval, labeling, promotion and marketing, distribution, post-approval monitoring and reporting, sampling and import and export of pharmaceutical products. Failure to comply with applicable U.S. requirements may subject a company to a variety of administrative or judicial sanctions, such as FDA refusal to approve pending NDAs or BLAs, warning or untitled letters, product recalls, product seizures, total or partial suspension of production or distribution, injunctions, fines, civil penalties and criminal prosecution.

We cannot market a new drug or biological product candidate, including gene therapy product candidates which are regulated as biologics, in the United States until the product candidate has received FDA approval. The steps required before a new drug or biologic may be marketed in the United States generally include the following:

- completion of extensive nonclinical laboratory tests, animal studies, and formulation studies in accordance with the FDA's Good Laboratory Practice (“GLP’’) regulations;
- submission to the FDA of an investigational new drug application (“IND’’) for human clinical testing, which must become effective before human clinical trials may begin;
- 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 drug for each proposed indication;
- submission to the FDA of an NDA or BLA, in the case of biological product candidates including gene therapy product candidates, after completion of all pivotal clinical trials;
- satisfactory completion of an FDA inspection of sites involved in our clinical trials;
- satisfactory completion of an FDA pre-approval inspection of the manufacturing facility or facilities at which the active pharmaceutical ingredient (“API’’) and finished drug product or biological product are produced and tested to assess compliance with cGMPs; and
- FDA review and approval of the NDA or BLA prior to any commercial marketing or sale of the drug in the United States.

Satisfaction of FDA pre-market approval requirements typically takes many years and the actual time required may vary substantially based upon the type, complexity and novelty of the product or disease.

Nonclinical tests include laboratory evaluation of product chemistry, formulation and toxicity, as well as animal trials to assess the characteristics and potential safety and efficacy of the product. The conduct of the nonclinical tests must comply with federal regulations and requirements, including GLP regulations. The results of nonclinical testing are submitted to the FDA as part of an IND along with other information, including information about product chemistry, manufacturing and controls and a proposed clinical trial protocol. Long-term nonclinical tests, such as animal tests of reproductive toxicity and carcinogenicity, may continue after the IND is submitted.

A 30-day waiting period after the submission of each IND is required prior to the commencement of clinical testing in humans. If the FDA has neither commented on nor questioned the IND within this 30-day period, the clinical trial proposed in the IND may begin. If the FDA raises concerns or questions about the conduct of the trial, such as whether human research subjects will be exposed to an unreasonable health risk, the IND sponsor and the FDA must resolve any outstanding FDA concerns or questions before clinical trials can proceed.

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Clinical trials involve the administration of the investigational new drug to healthy volunteers or patients under the supervision of a qualified investigator. Clinical trials must be conducted in compliance with federal regulations, including GCP requirements, as well as under protocols detailing the objectives of the trial, the parameters to be used in monitoring safety and the effectiveness criteria to be evaluated. Each protocol and subsequent protocol amendments must be submitted to the FDA as part of the IND.

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

U.S. Biological Products Development Process

Before testing any biological product candidate, including a gene therapy product, in humans, the product candidate enters the nonclinical testing stage. Nonclinical tests include laboratory evaluations of product chemistry, toxicity and formulation, as well as animal studies to assess the potential safety and activity of the product candidate. The conduct of the nonclinical tests must comply with federal regulations and requirements including GLPs.

Where a gene therapy study is conducted at, or sponsored by, institutions receiving funding from the NIH for recombinant DNA research, prior to the submission of an IND to the FDA, a protocol and related documentation is submitted to and the study is registered with the NIH Office of Biotechnology Activities (“OBA’’), pursuant to the NIH Guidelines for Research Involving Recombinant DNA Molecules (“NIH Guidelines’’). Compliance with the NIH Guidelines is mandatory for investigators at institutions receiving NIH funds for research involving recombinant DNA, however many companies and other institutions not otherwise subject to the NIH Guidelines voluntarily follow them. The NIH is responsible for convening the NIH Office of Biotechnology Activities’ Recombinant DNA Advisory Committee (“RAC’’), a federal advisory committee, that discusses protocols that raise novel or particularly important scientific, safety or ethical considerations at one of its quarterly public meetings. The OBA will notify the FDA of the RAC’s decision regarding the necessity for full public review of a gene therapy protocol. RAC proceedings and reports are posted to the OBA website and may be accessed by the public. Recent changes in the procedures for the RAC process issued by the NIH now include evaluation and assessment by an institutional biosafety committee (“IBC”), a local institutional committee that reviews and oversees research utilizing recombinant or synthetic nucleic acid molecules at that institution. The IBC assesses the safety of the research and identifies any potential risk to public health or the environment, and such review may result in some delay before initiation of a clinical trial. Annual reporting of clinical trial data including safety information also is required.

The clinical study sponsor must submit the results of the nonclinical tests, together with manufacturing information, analytical data, any available clinical data or literature and a proposed clinical protocol, to the FDA as part of the IND. Some nonclinical testing typically continues after the IND is submitted. An IND is an exemption from the FDCA that allows an unapproved product to be shipped in interstate commerce for use in an investigational clinical trial and a request for FDA authorization to administer an investigational product to humans. The IND automatically becomes effective 30 days after receipt by the FDA, unless the FDA requests certain changes to a protocol before the study can begin, or the FDA places the clinical study on a clinical hold within that 30-day time period. In such a case, the IND sponsor and the FDA must resolve any outstanding concerns before the clinical study can begin. With gene therapy protocols, if the FDA allows the IND to proceed, but the RAC decides that full public review of the protocol is warranted, the FDA will request at the completion of its IND review that sponsors delay initiation of the protocol until after completion of the RAC review process. The FDA may also impose clinical holds on a biological product candidate at any time before or during clinical trials due to safety concerns or non-compliance. If the FDA imposes a clinical hold, studies may not recommence without FDA authorization and then only under terms authorized by the FDA. Accordingly, we cannot be sure that submission of an IND will result in the FDA allowing clinical trials to begin, or that, once begun, issues will not arise that suspend or terminate such studies.

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Clinical trials involve the administration of the biological product candidate to healthy volunteers or subjects under the supervision of qualified investigators, generally physicians not employed by or under the study sponsor's control. Clinical trials are conducted under protocols detailing, among other things, the objectives of the clinical study, dosing procedures, subject selection and exclusion criteria, and the parameters to be used to monitor subject safety, including stopping rules that assure a clinical study will be stopped if certain adverse events should occur. Each protocol and any amendments to the protocol must be submitted to the FDA as part of the IND. Clinical trials must be conducted and monitored in accordance with the FDA's regulations comprising the GCP requirements, including the requirement that all research subjects provide informed consent. Further, each clinical study must be reviewed and approved by an independent IRB, at or servicing each institution at which the clinical study will be conducted. An IRB is charged with protecting the welfare and rights of study participants and considers such items as whether the risks to individuals participating in the clinical trials are minimized and are reasonable in relation to anticipated benefits. The IRB also approves the form and content of the informed consent that must be signed by each clinical study subject or his or her legal representative and must monitor the clinical study until completed. Additionally, some trials are overseen by an independent group of qualified experts organized by the trial sponsor, known as a data safety monitoring board or committee. Clinical trials involving recombinant or synthetic (or both) nucleic acid molecules performed at or sponsored by an institution that receives any NIH funding for such research also must be reviewed by an IBC, a local institutional committee that reviews and oversees basic and clinical research conducted at that institution. The IBC assesses the safety of the research and identifies any potential risk to public health or the environment.

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

- Phase 1. The biological product is initially introduced into healthy human subjects and tested for safety. In the case of some products for severe or life-threatening diseases, especially when the product may be too inherently toxic to ethically administer to healthy volunteers, the initial human testing is often conducted in patients. Guidelines on clinical trials with gene therapy products issued by the FDA's Office of Tissues and Advanced Therapies state that the FDA has determined that the benefit-risk ratio of these products does not warrant their evaluation in healthy human subjects.
- Phase 2. The biological product is evaluated in 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, optimal dosage and dosing schedule.
- Phase 3. Clinical trials are undertaken to further evaluate dosage, clinical efficacy, potency and safety in an expanded patient population at geographically dispersed clinical trial sites. These clinical trials are intended to establish the overall risk/benefit ratio of the product and provide an adequate basis for product labeling.

Post-approval clinical trials, sometimes referred to as Phase 4 clinical trials, may be conducted after initial marketing approval. These clinical trials are used to gain additional experience from the treatment of patients in the intended therapeutic indication, particularly for long-term safety follow-up. The FDA recommends that sponsors observe subjects for potential gene therapy-related delayed adverse events for a 15-year period, including a minimum of five years of annual examinations followed by ten years of annual queries, either in person or by questionnaire, of trial subjects.

During all phases of clinical development, regulatory agencies require extensive monitoring and auditing of all clinical activities, clinical data, and clinical trial investigators. Annual progress reports detailing the results of the clinical trials must be submitted to the FDA. Written IND safety reports must be promptly submitted to the FDA and the investigators for serious and unexpected adverse events, any findings from other studies, tests in laboratory animals or in vitro testing that suggest a significant risk for human subjects, or any clinically important increase in the rate of a serious suspected adverse reaction over that listed in the protocol or investigator brochure. The sponsor must submit an IND safety report within 15 calendar days after the sponsor determines that the information qualifies for reporting. The sponsor also must notify the FDA of any unexpected fatal or life-threatening suspected adverse reaction within seven calendar days after the sponsor's initial receipt of the information. Phase 1, Phase 2 and Phase 3 clinical trials may not be completed successfully within any specified period, if at all. The FDA or the sponsor or its data safety monitoring board may suspend a clinical trial at any time on various grounds, including a finding that the research subjects or patients are being exposed to an unacceptable health risk. Similarly, an IRB can suspend or

terminate approval of a clinical trial at its institution if the clinical trial is not being conducted in accordance with the IRB's requirements or if the biological product has been associated with unexpected serious harm to patients.
Human gene therapy products are a new category of therapeutics, regulated as biologics. Because this is a relatively new and expanding area of novel therapeutic interventions, there can be no assurance as to the length of the study period, the number of patients the FDA will require to be enrolled in the studies in order to establish the safety, efficacy, purity and potency of human gene therapy products, or that the data generated in these studies will be acceptable to the FDA to support marketing approval. The NIH and the FDA have a publicly accessible database, the Genetic Modification Clinical Research Information System which includes information on gene transfer studies and serves as an electronic tool to facilitate the reporting and analysis of adverse events on these studies.

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Concurrent with clinical trials, companies usually complete additional animal studies and must also develop additional information about the physical characteristics of the biological product as well as finalize a process for manufacturing the product in commercial quantities in accordance with cGMP requirements. To help reduce the risk of the introduction of adventitious agents with use of biological products, the PHSA emphasizes the importance of manufacturing control for products whose attributes cannot be precisely defined. The manufacturing process must be capable of consistently producing quality batches of the product candidate and, among other things, the sponsor must develop methods for testing the identity, strength, quality, potency and purity of the final biological product. Additionally, appropriate packaging must be selected and tested and stability studies must be conducted to demonstrate that the biological product candidate does not undergo unacceptable deterioration over its shelf life.

After the completion of clinical trials of a biological product, FDA approval of a BLA, must be obtained before commercial marketing of the biological product. The BLA must include results of product development, laboratory and animal studies, human studies, information on the manufacture and composition of the product, proposed labeling and other relevant information. In addition, under the Pediatric Research Equity Act (“PREA’’), a BLA or supplement to a BLA must contain data to assess the safety and effectiveness of the biological product 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 grant deferrals for submission of data or full or partial waivers. Unless otherwise required by regulation, PREA does not apply to any biological product for an indication for which orphan designation has been granted. The testing and approval processes require substantial time and effort and there can be no assurance that the FDA will accept the BLA for filing and, even if filed, that any approval will be granted on a timely basis, if at all.

Under the Prescription Drug User Fee Act, or PDUFA, as amended, each BLA must be accompanied by a significant user fee. Fee waivers or reductions are available in certain circumstances, including a waiver of the application fee for the first application filed by a small business. Additionally, no user fees are assessed on BLAs for product candidates designated as orphan drugs, unless the product candidate also includes a non-orphan indication.

Within 60 days following submission of the application, the FDA reviews a BLA submitted to determine if it is substantially complete before the agency accepts it for filing. The FDA may refuse to file any BLA that it deems incomplete or not properly reviewable at the time of submission and may request additional information. In this event, the BLA must be resubmitted with the additional information. The resubmitted application also is subject to review before the FDA accepts it for filing. The application also needs to be published and submitted in an electronic format that can be processed through the FDA’s electronic systems. If the electronic submission is not compatible with FDA’s systems, the BLA can be refused to file. Once the submission is accepted for filing, the FDA begins an in-depth substantive review of the BLA. The FDA reviews the BLA to determine, among other things, whether the proposed product is safe, potent, and effective, for its intended use, and has an acceptable purity profile, and whether the product is being manufactured in accordance with cGMP to assure and preserve the product’s identity, safety, strength, quality, potency and purity. The FDA may refer applications for novel biological products or biological products that present difficult questions of safety or efficacy to an advisory committee, typically a panel that includes clinicians and other experts, for review, evaluation and a recommendation as to whether the application should be approved 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. During the biological product approval process, the FDA also will determine whether a Risk Evaluation and Mitigation Strategy (“REMS’’), is necessary to assure the safe use of the biological product. If the FDA concludes a REMS is needed, the sponsor of the BLA must submit a proposed REMS; the FDA will not approve the BLA without a REMS, if required.

Before approving a BLA, the FDA will inspect the facilities at which the product is manufactured. The FDA will not approve the product unless it determines that the manufacturing processes and facilities are in compliance with cGMP requirements and adequate to assure consistent production of the product within required specifications. Additionally, before approving a BLA, the FDA will typically inspect one or more clinical trial sites to assure that the clinical trials were conducted in compliance with IND study requirements and GCP requirements. To assure cGMP and GCP compliance, an applicant must incur significant expenditure of time, money and effort in the areas of training, record keeping, production, and quality control.

Notwithstanding the submission of relevant data and information, the FDA may ultimately decide that the BLA does not satisfy its regulatory criteria for approval and deny approval. Data obtained from clinical trials are not always conclusive and the FDA may interpret data differently than we interpret the same data. If the agency decides not to approve the BLA in its present form, the FDA will issue a complete response letter that usually describes all of the specific deficiencies in the BLA identified by the FDA. The deficiencies identified may be minor, for example, requiring labeling changes, or major, for example, requiring additional clinical trials. Additionally, the complete response letter may include recommended actions that the applicant might take to place the application in a condition for approval. If a complete response letter is issued, the applicant may either resubmit the BLA, addressing all of the deficiencies identified in the letter, or withdraw the application.

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If a product receives regulatory approval, the approval may be significantly limited to specific diseases and dosages or the indications for use may otherwise be limited, which could restrict the commercial value of the product. Further, the FDA may require that certain contraindications, warnings or precautions be included in the product labeling. The FDA may impose restrictions and conditions on product distribution, prescribing, or dispensing in the form of a risk management plan, or otherwise limit the scope of any approval. In addition, the FDA may require post marketing clinical trials, sometimes referred to as Phase 4 clinical trials, designed to further assess a biological product's safety and effectiveness, and testing and surveillance programs to monitor the safety of approved products that have been commercialized. As a condition for approval, the FDA may also require additional nonclinical testing as a Phase 4 commitment.

One of the performance goals agreed to by the FDA under the PDUFA is to review standard BLAs in 10 months from filing and priority BLAs in six months from filing, whereupon a review decision is to be made. The FDA does not always meet its PDUFA goal dates for standard and priority BLAs and its review goals are subject to change from time to time. The review process and the PDUFA goal date may be extended by three months if the FDA requests or the BLA sponsor otherwise provides additional information or clarification regarding information already provided in the submission within the last three months before the PDUFA goal date.

Maintaining substantial compliance with applicable federal, state, and local statutes and regulations requires the expenditure of substantial time and financial resources. Rigorous and extensive FDA regulation of biological products continues after approval, particularly with respect to cGMP. We will rely, and expect to continue to rely, on third parties for the production of clinical and commercial quantities of any products that we may commercialize. Manufacturers of our products are required to comply with applicable requirements in the cGMP regulations, including quality control and quality assurance and maintenance of records and documentation. Following approval, the manufacturing facilities are subject to biennial inspections by the FDA's biologics team and such inspections may result in an issuance of FDA Form 483 deficiency observations or a warning letter, which can lead to plant shutdown and other more serious penalties and fines. Prior to the institution of any manufacturing changes, a determination needs to be made whether FDA approval is required in advance. If not done in accordance with FDA expectations, the FDA may restrict supply and may take further action. Annual product reports are required to be submitted annually. Other post-approval requirements applicable to biological products, include reporting of cGMP deviations that may affect the identity, potency, purity and overall safety of a distributed product, record-keeping requirements, reporting of adverse effects, reporting updated safety and efficacy information, and complying with electronic record and signature requirements. After a BLA is approved, the product also may be subject to official lot release. As part of the manufacturing process, the manufacturer is required to perform certain tests on each lot of the product before it is released for distribution. If the product is subject to official release by the FDA, the manufacturer submits samples of each lot of product to the FDA together with a release protocol showing a summary of the history of manufacture of the lot and the results of all of the manufacturer's tests performed on the lot. The FDA also may perform certain confirmatory tests on lots of some products, such as viral vaccines, before releasing the lots for distribution by the manufacturer. In addition, the FDA conducts laboratory research related to the regulatory standards on the safety, purity, potency, and effectiveness of biological products. Systems need to be put in place to record and evaluate adverse events reported by health care providers and patients and to assess product complaints. An increase in severity or new adverse events can result in labeling changes or product recall. Defects in manufacturing of commercial products can result in product recalls.

We also must comply with the FDA's advertising and promotion requirements, such as those related to direct-to-consumer advertising, the prohibition on promoting products for uses or in patient populations that are not described in the product's approved labeling (known as "off-label use"), industry-sponsored scientific and educational activities, and promotional activities involving the internet. Discovery of previously unknown problems or the failure to comply with the applicable regulatory requirements may result in restrictions on the marketing of a product or withdrawal of the product from the market as well as possible civil or criminal sanctions. 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 or manufacturer to administrative or judicial civil or criminal sanctions and adverse publicity. FDA sanctions could include refusal to approve pending applications, withdrawal of an approval or license

revocation, clinical hold, warning or untitled letters, product recalls, product seizures, total or partial suspension of production or distribution, injunctions, fines, refusals of government contracts, mandated corrective advertising or communications with doctors, debarment, restitution, disgorgement of profits, or civil or criminal penalties. Any agency or judicial enforcement action could have a material adverse effect on us.

Biological product manufacturers and other entities involved in the manufacture and distribution of approved biological products are required to register their establishments with the FDA and certain state agencies, and are subject to periodic unannounced inspections by the FDA and certain state agencies for compliance with cGMPs and other laws. Accordingly, manufacturers must continue to expend time, money, and effort in the area of production and quality control to maintain cGMP compliance. Discovery of problems with a product after approval may result in restrictions on a product, manufacturer, or holder of an approved BLA, including withdrawal of the product from the market. In addition, changes to the manufacturing process or facility generally require prior FDA approval before being implemented and other types of changes to the approved product, such as adding new indications and additional labeling claims, are also subject to further FDA review and approval.

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U.S. Pharmaceutical Products Development Process

Clinical trials to support NDAs for marketing approval for pharmaceutical drug candidates are typically conducted in three sequential phases, but the phases may overlap. In Phase 1, the initial introduction of the drug into healthy human subjects or patients, the drug is tested to assess pharmacological actions, pharmacokinetics, metabolism, side effects associated with increasing doses and, if possible, early evidence on effectiveness. Phase 2 usually involves trials in a limited patient population to determine metabolism, pharmacokinetics, the effectiveness of the drug for a particular indication, dosage tolerance and optimum dosage, and to identify common adverse effects and safety risks. If a compound demonstrates evidence of effectiveness and an acceptable safety profile in Phase 2 evaluations, Phase 3 clinical trials, also called pivotal or registration trials, are undertaken to obtain the additional information about clinical efficacy and safety in a larger number of patients, typically at geographically dispersed clinical trial sites, to permit the FDA to evaluate the overall benefit-risk relationship of the drug and to provide adequate information for the labeling of the drug. In most cases, the FDA requires two adequate and well controlled Phase 3 clinical trials to demonstrate the efficacy of the drug. A single Phase 3 clinical trial with other confirmatory evidence may be sufficient in rare instances where the study is a large multicenter trial demonstrating internal consistency and a statistically very persuasive finding of a clinically meaningful effect on mortality, irreversible morbidity or prevention of a disease with a potentially serious outcome and where confirmation of the result in a second trial would be practically or ethically impossible.

After completion of the required clinical testing, an NDA is prepared and submitted to the FDA. FDA approval of the NDA is required before marketing of the product may begin in the United States. The NDA must include the results of all nonclinical, clinical and other testing and a compilation of data relating to the product's pharmacology, chemistry, manufacture and controls. The cost of preparing and submitting an NDA is substantial. The submission of most NDAs is additionally subject to a substantial application user fee, and the manufacturer and/or sponsor under an approved NDA are also subject to annual program fees. These fees are typically increased annually.

The FDA has 60 days from its receipt of an NDA to determine whether the application will be accepted for filing based on the agency's threshold determination that it is sufficiently complete to permit substantive review. Once the submission is accepted for filing, the FDA begins an in-depth review. The FDA has agreed to certain performance goals in the review of NDAs. Most such applications for standard review drug products are reviewed within 10 to 12 months; most applications for priority review drugs are reviewed in six to eight months. Priority review can be applied to drugs to treat serious conditions that the FDA determines offer significant improvement in safety or effectiveness. The review process for both standard and priority review may be extended by the FDA for three additional months to consider certain late-submitted information, or information intended to clarify information already provided in the submission.

The FDA may also refer applications for novel drug products, or drug products that present difficult questions of safety or efficacy, to an advisory committee—typically a panel that includes clinicians and other experts—for review, evaluation and a recommendation as to whether the application should be approved. The FDA is not bound by the recommendation of an advisory committee, but it generally follows such recommendations. Before approving an NDA, the FDA will typically inspect one or more clinical sites to assure compliance with GCPs. Additionally, the FDA will inspect the facility or the facilities at which the drug is manufactured. The FDA will not approve the product unless compliance with cGMPs and GCPs is satisfactory and the NDA contains data that provide substantial evidence that the drug is safe and effective in the indication studied.

After the FDA evaluates the NDA and the manufacturing facilities and clinical sites, it issues either an approval letter or a complete response letter. A complete response letter generally outlines the deficiencies in the submission and may require substantial additional testing, or information, in order for the FDA to reconsider the application. If, or when, those deficiencies have been addressed to the FDA's satisfaction in a resubmission of the NDA, the FDA will issue an approval letter. The FDA has committed to reviewing such resubmissions in two or six months depending on the type of information included.

An approval letter authorizes commercial marketing of the drug with specific prescribing information for specific indications. As a condition of NDA approval, the FDA may require a Risk Evaluation and Mitigation Strategy (“REMS’’) to ensure that the benefits of the drug outweigh the potential risks. A REMS can include a medication guide,

a communication plan for healthcare professionals and elements to assure safe use, such as special training and certification requirements for individuals who prescribe or dispense the drug, requirements that patients enroll in a registry and other measures that the FDA deems necessary to assure the safe use of the drug. The requirement for a REMS can materially affect the potential market and profitability of the drug. Moreover, product approval may require substantial post-approval testing and surveillance to monitor the drug's safety or efficacy. Once granted, product approvals may be withdrawn if compliance with regulatory standards is not maintained or problems are identified following initial marketing.

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Changes to some of the conditions established in an approved application, including changes in indications, labeling, or manufacturing processes or facilities, require submission and FDA approval of a new NDA or NDA supplement before the change can be implemented. An NDA supplement for a new indication typically requires clinical data similar to that in the original application, and the FDA uses the same procedures and actions in reviewing NDA supplements as it does in reviewing NDAs. Such supplements are typically reviewed within 10 months of receipt.
Once an NDA is approved, a product is subject to post-approval requirements. For instance, the FDA closely regulates the post-approval marketing and promotion of drugs, including standards and regulations for direct-to-consumer advertising, off-label promotion, industry-sponsored scientific and educational activities and promotional activities involving the internet and social media. Drugs may be marketed only for the approved indications and in accordance with the provisions of the approved labeling.
Adverse event reporting and submission of periodic reports is required following FDA approval of an NDA. The FDA also may require post-marketing testing, known as Phase 4 testing, REMS or surveillance to monitor the effects of an approved product, or restrictions on the distribution or use of the product. In addition, quality-control, drug manufacture, packaging and labeling procedures must continue to conform to cGMPs after approval. Drug manufacturers and certain of their subcontractors are required to register their establishments with the FDA and certain state agencies. Registration with the FDA subjects entities to periodic unannounced inspections by the FDA, during which the agency inspects manufacturing facilities to assess compliance with cGMPs. Accordingly, manufacturers must continue to expend time, money and effort in the areas of production and quality-control to maintain compliance with cGMPs. Later discovery of previously unknown problems with a product, including adverse events of unanticipated severity or frequency, or failure to comply with regulatory requirements, may result in, 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 applications or supplements to approved applications, or suspension or revocation of product 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.

Market and Data Exclusivity

The Patient Protection and Affordable Care Act of 2010, as amended by the Health Care and Education Reconciliation Act of 2010, collectively referred to as the Affordable Care Act, included a subtitle called the Biologics Price Competition and Innovation Act of 2009 or BPCIA. The BPCIA established a regulatory scheme authorizing the FDA to approve biosimilars and interchangeable biosimilars. As of January 1, 2018, the FDA has approved nine biosimilar products for use in the United States. No interchangeable biosimilars have been approved. The FDA has issued several guidance documents outlining an approach to review and approval of biosimilars. Additional guidance is expected to be finalized by FDA in the near term.
Under the BPCIA, a manufacturer may submit an application for licensure of a biologic product that is “biosimilar to” or “interchangeable with” a previously approved biological product or “reference product.” In order for the FDA to approve a biosimilar product, it must find that there are no clinically meaningful differences between the reference product and proposed biosimilar product in terms of safety, purity and potency. For the FDA to approve a biosimilar product as interchangeable with a reference product, the FDA must find that the biosimilar product can be expected to produce the same clinical results as the reference product and (for products administered multiple times) that the biologic and the reference biologic may be switched after one has been previously administered without increasing safety risks or risks of diminished efficacy relative to exclusive use of the reference biologic.
Under the BPCIA, an application for a biosimilar product may not be submitted to the FDA until four years following the date of approval of the reference product. The FDA may not approve a biosimilar product until 12 years from the date on which the reference product was approved. The BPCIA also requires a 180-day notice of commercial

marketing. Even if a product is considered to be a reference product eligible for exclusivity, another company could market a competing version of that product if the FDA approves a full BLA for such product containing the sponsor's own nonclinical data and data from adequate and well-controlled clinical trials to demonstrate the safety, purity and potency of their product. The BPCIA also created certain exclusivity periods for biosimilars approved as interchangeable products. At this juncture, it is unclear whether products deemed "interchangeable" by the FDA will, in fact, be readily substituted by pharmacies, which are governed by state pharmacy law.

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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 and jurisdictions regarding quality, safety and efficacy and governing, among other things, clinical trials, marketing authorization, commercial sales and distribution of our products. Whether or not we obtain FDA approval for a product, we would need to obtain the necessary approvals by the comparable foreign regulatory authorities before we can commence clinical trials or marketing of the product in foreign countries and jurisdictions. Although many of the issues discussed above with respect to the United States apply similarly in the context of the European Union, the approval process varies between countries and jurisdictions and can involve additional product testing and additional administrative review periods. The time required to obtain approval in other countries and jurisdictions might differ from and be longer than that required to obtain FDA approval. Regulatory approval in one country or jurisdiction does not ensure regulatory approval in another, but a failure or delay in obtaining regulatory approval in one country or jurisdiction may negatively impact the regulatory process in others.

To obtain regulatory approval of an investigational biological product under EU regulatory systems, we must submit a marketing authorization application. The application used to file the BLA in the United States is similar to that required in the European Union, with the exception of, among other things, country-specific document requirements. The process for doing this depends, among other things, on the nature of the medicinal product.

The centralized procedure results in a single marketing authorization, or MA, granted by the European Commission that is valid across the EEA (i.e., the European Union as well as Iceland, Liechtenstein and Norway). The centralized procedure is compulsory for human drugs that are: (i) derived from biotechnology processes, such as genetic engineering, (ii) contain a new active substance indicated for the treatment of certain diseases, such as HIV/AIDS, cancer, diabetes, neurodegenerative diseases, autoimmune and other immune dysfunctions and viral diseases, (iii) officially designated orphan medicines and (iv) advanced-therapy medicines, such as gene therapy, somatic cell therapy or tissue-engineered medicines. The centralized procedure may at the request of the applicant also be used in certain other cases. Therefore, the centralized procedure would be mandatory for the products we are developing.

The Committee for Advanced Therapies ("CAT") is responsible in conjunction with the CHMP for the evaluation of ATMPs. The CAT is primarily responsible for the scientific evaluation of ATMPs and prepares a draft opinion on the quality, safety and efficacy of each ATMP for which a marketing authorization application is submitted. The CAT's opinion is then taken into account by the CHMP when giving its final recommendation regarding the authorization of a product in view of the balance of benefits and risks identified. Although the CAT's draft opinion is submitted to the CHMP for final approval, the CHMP may depart from the draft opinion, if it provides detailed scientific justification.

The CHMP and CAT are also responsible for providing guidelines on ATMPs and have published numerous guidelines, including specific guidelines on gene therapies and cell therapies. These guidelines provide additional guidance on the factors that the EMA will consider in relation to the development and evaluation of ATMPs and include, among other things, the preclinical studies required to characterize ATMPs; the manufacturing and control information that should be submitted in a marketing authorization application; and post-approval measures required to monitor patients and evaluate the long term efficacy and potential adverse reactions of ATMPs. Although these guidelines are not legally binding, we believe that our compliance with them is likely necessary to gain and maintain approval for any of our product candidates.

Under the centralized procedure in the European Union, the maximum timeframe for the evaluation of an MAA by the EMA is 210 days. This excludes so-called clock stops, during which additional written or oral information is to be provided by the applicant in response to questions asked by the CHMP. At the end of the review period, the CHMP provides an opinion to the European Commission. If this is opinion favorable, the Commission may then adopt a decision to grant an MA. In exceptional cases, the CHMP might perform an accelerated review of an MAA in no more than 150 days (not including clock stops). This is usually when the product is of major interest from the point of view of public health and, in particular, from the viewpoint of therapeutic innovation.

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EU Data and Marketing Exclusivity

The European Union also provides opportunities for market exclusivity. Marketing authorization applications for generic medicinal products do not need to include the results of preclinical and clinical trials, but instead can refer to the data included in the marketing authorization of a reference product for which regulatory data exclusivity has expired. In the European Union, upon receiving marketing authorization, new chemical entities generally receive eight years of data exclusivity and an additional two years of market exclusivity. The two-year period may be extended to three years if during the first eight years a new therapeutic indication with significant clinical benefit over existing therapies is approved. If granted, data exclusivity prevents regulatory authorities in the European Union from referencing the innovator's data to assess a generic application. During the additional two-year period of market exclusivity, a generic marketing authorization can be submitted, and the innovator's data may be referenced, but no generic product can be marketed until the expiration of the market exclusivity. However, there is no guarantee that a product will be considered by the EU regulatory authorities to be a new chemical entity, and products may not qualify for data exclusivity.

There is a special regime for biosimilars, or biological medicinal products that are similar to a reference medicinal product but that do not meet the definition of a generic medicinal product, for example, because of differences in raw materials or manufacturing processes. For such products, the results of appropriate preclinical or clinical trials must be provided, and guidelines from the EMA detail the type of quantity of supplementary data to be provided for different types of biological product. There are no such guidelines for complex biological products, such as gene or cell therapy medicinal products, and so it is unlikely that biosimilars of those products will currently be approved in the European Union. However, guidance from the EMA states that they will be considered in the future in light of the scientific knowledge and regulatory experience gained at the time.

EU Orphan Medicinal Products

Products receiving orphan designation in the European Union can receive ten years of market exclusivity. During the ten year market exclusivity period, the EMA cannot accept another application for a marketing authorization, or grant a marketing authorization or accept an application to extend an existing marketing authorization, for the same therapeutic indication, in respect of a similar medicinal product. An orphan product can also obtain an additional two years of market exclusivity in the European Union for pediatric studies. No extension to any supplementary protection certificate can be granted on the basis of pediatric studies for orphan indications.

The criteria for designating an "orphan medicinal product" in the European Union are similar in principle to those in the United States. Under Article 3 of Regulation (EC) 141/2000, a medicinal product may be designated as orphan if (1) it is intended for the diagnosis, prevention or treatment of a life-threatening or chronically debilitating condition; (2) either (a) such condition affects no more than five in 10,000 persons in the European Union when the application is made, or (b) the product, without the benefits derived from orphan status, would not generate sufficient return in the European Union to justify investment; and (3) there exists no satisfactory method of diagnosis, prevention or treatment of such condition authorized for marketing in the European Union, or if such a method exists, the product will be of significant benefit to those affected by the condition, as defined in Regulation (EC) 847/2000. Orphan medicinal products are eligible for financial incentives such as reduction of fees or fee waivers. The application for orphan drug designation must be submitted before the MAA. The applicant will receive a fee reduction for the MAA if the orphan drug designation has been granted, but not if the designation is still pending at the time the marketing authorization is submitted. Orphan drug designation does not convey any advantage in, or shorten the duration of, the regulatory review and approval process.

The ten-year market exclusivity may be reduced to six years if, at the end of the fifth year, it is established that the product no longer meets the criteria for orphan designation, for example, if the product is sufficiently profitable not to justify maintenance of market exclusivity. Additionally, an MA may be granted to a similar product for the same indication at any time if:

- the second applicant can establish that its product, although similar, is safer, more effective or otherwise clinically superior;
- the applicant consents to a second orphan medicinal product application; or

- the applicant cannot supply enough orphan medicinal product.

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EU Pediatric Investigation Plan

In the EMA, MAAs for new medicinal products not authorized have to include the results of trials conducted in the pediatric population, in compliance with a pediatric investigation plan, or PIP, agreed with the EMA's Pediatric Committee, or PDCO. The PIP sets out the timing and measures proposed to generate data to support a pediatric indication of the drug for which an MA is being sought. The PDCO can grant a deferral of the obligation to implement some or all of the measures of the PIP until there are sufficient data to demonstrate the efficacy and safety of the product in adults. Further, the obligation to provide pediatric clinical trial data can be waived by the PDCO when these data are not needed or appropriate because the product is likely to be ineffective or unsafe in children, the disease or condition for which the product is intended occurs only in adult populations, or when the product does not represent a significant therapeutic benefit over existing treatments for pediatric patients. Once the MA is obtained in all EU Member States and trial results are included in the product information, even when negative, the product is eligible for a six-months supplementary protection certificate extension.

EU Post-Approval Controls

The holder of an MA must establish and maintain a pharmacovigilance system and appoint an individual qualified person for pharmacovigilance who is responsible for oversight of that system. Key obligations include expedited reporting of suspected serious adverse reactions and submission of periodic safety update reports, or PSURs.

All new MAAs must include a risk management plan, or RMP, describing the risk management system that the company will put in place and documenting measures to prevent or minimize the risks associated with the product. The regulatory authorities may also impose specific obligations as a condition of the marketing authorization. Such risk-minimization measures or post-authorization obligations may include additional safety monitoring, more frequent submission of PSURs, or the conduct of additional clinical trials or post-authorization safety studies. RMPs and PSURs are routinely available to third parties requesting access, subject to limited redactions.

All advertising and promotional activities for the product must be consistent with the approved summary of product characteristics, and therefore all off-label promotion is prohibited. Direct-to-consumer advertising of prescription medicines is also prohibited in the European Union. Although general requirements for advertising and promotion of medicinal products are established under EU directives, the details are governed by regulations in each EU Member State and can differ from one country to another.

EU Pricing and Reimbursement

Governments influence the price of medicinal products in the European Union through their pricing and reimbursement rules and control of national healthcare systems that fund a large part of the cost of those products to consumers. Some jurisdictions operate positive and negative list systems under which products may only be marketed once a reimbursement price has been agreed. To obtain reimbursement or pricing approval, some of these countries may require the completion of clinical trials that compare the cost-effectiveness of a particular product candidate to currently available therapies. Other EU Member States allow companies to fix their own prices for medicines, but monitor and control company profits. The downward pressure on healthcare costs in general, particularly prescription medicines, has become very intense. As a result, increasingly high barriers are being erected to the entry of new products.

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Other Healthcare Laws

Although we currently do not have any products on the market, our current and future business operations may be subject to additional healthcare regulation and enforcement by the federal government and by authorities in the states and foreign jurisdictions in which we conduct our business. Such laws include, without limitation, state and federal anti-kickback, fraud and abuse, false claims, privacy and security, price reporting and physician sunshine laws. Some of our pre-commercial activities are subject to some of these laws.

The federal Anti-Kickback Statute makes it illegal for any person or entity, including a prescription drug manufacturer or a party acting on its behalf, to knowingly and willfully solicit, receive, offer, or pay any remuneration, directly or indirectly, that is intended to induce the referral of business, including the purchase, order, lease of any good, facility, item or service for which payment may be made under a federal healthcare program, such as Medicare or Medicaid. The term "remuneration" has been broadly interpreted to include anything of value, including cash, improper discounts, and free or reduced-price items and services. The Anti-Kickback Statute has been interpreted to apply to arrangements between pharmaceutical manufacturers on one hand and prescribers, purchasers, formulary managers, and beneficiaries on the other. Although there are a number of statutory exceptions and regulatory safe harbors protecting some common activities from prosecution, the exceptions and safe harbors are drawn narrowly. Practices that involve remuneration that may be alleged to be intended to induce prescribing, purchases or recommendations may be subject to scrutiny if they do not qualify for an exception or safe harbor. Failure to meet all of the requirements of a particular applicable statutory exception or regulatory safe harbor does not make the conduct per se illegal under the Anti-Kickback Statute. Instead, the legality of the arrangement will be evaluated on a case-by-case basis based on a cumulative review of all its facts and circumstances. 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 Anti-Kickback Statute has been violated. Violations of this law are punishable by up to five years in prison, and can also result in criminal fines, administrative civil money penalties and exclusion from participation in federal healthcare programs.

Additionally, the intent standard under the Anti-Kickback Statute was amended by the Affordable Care Act, to a stricter standard such that a person or entity no longer needs to have actual knowledge of the statute or specific intent to violate it in order to have committed a violation. In addition, the Affordable Care Act codified case law that a claim including items or services resulting from a violation of the federal Anti-Kickback Statute constitutes a false or fraudulent claim for purposes of the federal civil False Claims Act.

The federal civil False Claims Act prohibits, among other things, any person or entity from knowingly presenting, or causing to be presented, for payment to, or approval by, federal programs, including Medicare and Medicaid, claims for items or services, including drugs, that are false or fraudulent or not provided as claimed. Persons and entities can be held liable under these laws if they are deemed to "cause" the submission of false or fraudulent claims by, for example, providing inaccurate billing or coding information to customers or promoting a product off-label. In addition, certain of our future activities relating to the reporting of wholesaler or estimated retail prices for our products, the reporting of prices used to calculate Medicaid rebate information and other information affecting federal, state and third-party reimbursement for our products, and the sale and marketing of our products, are subject to scrutiny under this law. Penalties for federal civil False Claims Act violations may include up to three times the actual damages sustained by the government, plus mandatory civil penalties for each separate false claim, the potential for exclusion from participation in federal healthcare programs, and, although the federal False Claims Act is a civil statute, False Claims Act violations may also implicate various federal criminal statutes.

The federal Health Insurance Portability and Accountability Act of 1996 (“HIPAA’’) created new federal criminal statutes that prohibit among other actions, 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. Like the federal Anti-Kickback Statute, the Affordable Care Act amended the intent standard for certain healthcare fraud statutes under HIPAA such that a person or entity no longer needs to have actual knowledge of the statute or specific

intent to violate it in order to have committed a violation.

The civil monetary penalties statute imposes penalties against any person or entity that, among other things, 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.

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HIPAA, as amended by the Health Information Technology for Economic and Clinical Health Act (“HITECH’’) and their implementing regulations, including the final omnibus rule published on January 25, 2013, mandates, among other things, the adoption of uniform standards for the electronic exchange of information in common healthcare transactions, as well as standards relating to the privacy and security of individually identifiable health information, which require the adoption of administrative, physical and technical safeguards to protect such information. Among other things, HITECH makes HIPAA's security standards directly applicable to business associates, defined as independent contractors or agents of covered entities that create, receive or obtain protected health information in connection with providing a service for or on behalf of a covered entity. At present, it is unclear if we would be considered a business associate subject to HIPAA based on our business activities and service offerings upon the commercialization of a product. HITECH also increased the civil and criminal penalties that may be imposed against covered entities and business associates, 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, certain state and foreign laws, regulations, standards and regulatory guidance govern the privacy and security of health information in certain circumstances, some of which are more stringent than HIPAA and many of which differ from each other in significant ways and may not have the same effect, thus complicating compliance efforts. Failure to comply with these laws, where applicable, can result in the imposition of significant civil and/or criminal penalties.

The Affordable Care Act, through the enactment of the Physician Payments Sunshine Act, imposes, among other things, new annual reporting requirements for covered manufacturers for certain payments and other transfers of value provided to physicians and teaching hospitals, as well as certain ownership and investment interests held by physicians and their immediate family members. Failure to submit timely, accurately and completely the required information for all payments, transfers of value and ownership or investment interests may result in civil monetary penalties.

Many states have similar fraud and abuse statutes or regulations that may be broader in scope and may apply regardless of payor, in addition to items and services reimbursed under Medicaid and other state programs. We may also be subject to state laws that require pharmaceutical companies to comply with the pharmaceutical industry’s voluntary compliance guidelines and the relevant compliance guidance promulgated by the federal government, state laws that require drug manufacturers to report information related to payments and other transfers of value to physicians and other healthcare providers or marketing expenditures as well as state and local laws that require the registration of pharmaceutical sales representatives. Additionally, to the extent that any of our products are sold in a foreign country, we may be subject to similar foreign laws.

Because we intend to commercialize products that could be reimbursed under a federal healthcare program and other governmental healthcare programs, we will continue to develop a comprehensive compliance program that establishes internal controls to facilitate adherence to the rules and program requirements to which we will or may become subject. Although the development and implementation of compliance programs designed to establish internal control and facilitate compliance can mitigate the risk of violating these laws, and the subsequent investigation, prosecution, and penalties assessed for violations of these laws, the risks cannot be entirely eliminated.

If our operations are found to be in violation of any of such laws or any other governmental regulations that apply to us, we may be subject to penalties, including, without limitation, administrative, civil and criminal penalties, damages, fines, disgorgement, contractual damages, reputational harm, diminished profits and future earnings, additional reporting requirements and oversight if we become subject to a corporate integrity agreement or similar agreement, the curtailment or restructuring of our operations, exclusion from participation in federal and state healthcare programs and individual imprisonment, any of which could adversely affect our ability to operate our business and our financial results.

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Foreign Corrupt Practices Act

We are subject to the Foreign Corrupt Practices Act of 1977, as amended (“FCPA’’). The FCPA prohibits U.S. companies and their representatives from processing, offering, or making payments of money or anything of value to foreign officials with the intent to obtain or retain business or seek a business advantage. In certain countries, the health care professionals we regularly interact with may meet the definition of a foreign government official for the purposes of the FCPA. Our international activities create the risk of unauthorized payments or offers of payments by our employees, consultants and agents, even though they may not always be subject to our control. We discourage these practices by our employees, consultants, and agents. However, our existing safeguards may prove to be less than effective, and our employees, consultants, and agents may engage in conduct for which we might be held responsible. Recently, there has been a substantial increase in anti-bribery law enforcement activity by U.S. regulators, with more frequent and aggressive investigations and enforcement activity by both the Department of Justice and the SEC. A determination that our operations or activities are not, or were not, in compliance with U.S. or foreign laws or regulations could result in the imposition of substantial fines, interruptions of business, loss of suppliers, vendor or other third-party relationships, termination of necessary licenses or permits, and legal or equitable sanctions. Other internal or governmental investigations or legal or regulatory proceedings, including lawsuits brought by private litigants, may also follow as a consequence.

Other Applicable Laws

We are subject to a variety of financial disclosure and securities trading regulations, both in the United States and in other jurisdictions in which we operate, as a public company in the U.S., including laws relating to the oversight activities of the SEC and the regulations of the Nasdaq Global Select Market, on which our common shares are traded. We are also subject to various other federal, state, and local laws and regulations, including those related to safe working conditions, and the storage, transportation, or discharge of items that may be considered hazardous substances, hazardous waste, or environmental contaminants.

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

We are also subject to or affected by federal, state and foreign privacy, security and data protection laws, regulations, standards and regulatory guidance that govern the collection, use, disclosure, retention, security and transfer of personal data. Our operations extend to countries around the world, and many of these jurisdictions have established privacy legal frameworks with which we, our customers or our vendors must comply.

Healthcare Reform

In the United States and foreign jurisdictions, there have been a number of legislative and regulatory changes to the healthcare system that could affect our future results of operations. There have been and continue to be a number of initiatives at the United States federal and state levels that seek to reduce healthcare costs.

In particular, the Affordable Care Act has had, and is expected to continue to have, a significant impact on the healthcare industry. The Affordable Care Act was designed to expand coverage for the uninsured while at the same time containing overall healthcare costs. With regard to pharmaceutical products, among other things, the Affordable Care Act revises the definition of “average manufacturer price’’ (“AMP’’) for calculating and reporting Medicaid drug rebates on outpatient prescription drug prices and imposes a significant annual fee on companies that manufacture or import certain branded prescription drug products. In January 2016, the Centers for Medicare and Medicaid Services issued a final rule regarding the Medicaid Drug Rebate Program, effective April 1, 2016, that, among other things, revises the manner in which the AMP is to be calculated by manufacturers participating in the program and implements certain amendments to the Medicaid rebate statute created under the Affordable Care Act. Substantial new provisions affecting compliance have also been enacted, which may require us to modify our business practices with

healthcare providers and entities, and a significant number of provisions are not yet, or have only recently become, effective.

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Since its enactment, there have been judicial and Congressional challenges to certain aspects of the Affordable Care Act, as well as efforts by the current administration to repeal or replace certain aspects of the Affordable Care Act. For example, since January 2017, the President has signed two Executive Orders and other directives designed to delay, circumvent, or loosen certain requirements mandated by the Affordable Care Act. Concurrently, Congress has considered legislation that would repeal or repeal and replace all or part of the Affordable Care Act. While Congress has not passed comprehensive repeal legislation, two bills affecting the implementation of certain taxes under the Affordable Care Act were signed into law. The Tax Cuts and Jobs Act of 2017, or the Tax Act, includes a provision repealing, effective January 1, 2019, the tax-based shared responsibility payment imposed by the Affordable Care Act on certain individuals who fail to maintain qualifying health coverage for all or part of a year that is commonly referred to as the "individual mandate." Additionally, on January 22, 2018, the President signed a continuing resolution on appropriations for fiscal year 2018 that delayed the implementation of certain Affordable Care Act -mandated fees, including the so-called "Cadillac" tax on certain high cost employer-sponsored insurance plans, the annual fee imposed on certain health insurance providers based on market share, and the medical device excise tax on non-exempt medical devices. Further, the Bipartisan Budget Act of 2018, or the BBA, among other things, amends the Affordable Care Act, effective January 1, 2019, to close the coverage gap in most Medicare drug plans, commonly referred to as the "donut hole," and increase from 50% to 70% the point-of-sale discount that is owed by pharmaceutical manufacturers who participate in the Medicare Part D program. There may be additional challenges and amendments to the Affordable Care Act in the future. The Affordable Care Act is likely to continue the downward pressure on pharmaceutical pricing and may also increase our regulatory burdens and operating costs.

Further, there has been heightened government scrutiny over the manner in which manufacturers set prices for their marketed pharmaceutical products. Such scrutiny has resulted in several recent Congressional inquiries and proposed and enacted federal and state legislation designed to, among other things, bring more transparency to pharmaceutical product pricing, review the relationship between pricing and manufacturer patient programs, and reform government program reimbursement methodologies for products. At the federal level, the current administration's budget proposal for fiscal year 2019 contains further drug price control measures that could be enacted during the 2019 budget process or in other future legislation, including, for example, measures to permit Medicare Part D plans to negotiate the price of certain drugs under Medicare Part B, to allow some states to negotiate drug prices under Medicaid, and to eliminate cost sharing for generic drugs for low-income patients. Additionally, on May 11, 2018, the President of the United States laid out his administration's "Blueprint to Lower Drug Prices and Reduce Out-of-Pocket Costs" to reduce the cost of prescription drugs while preserving innovation and cures. The Department of Health and Human Services has already started the process of soliciting feedback on some of these measures and, at the same time, is immediately implementing others under its existing authority. Although some of these and other proposals will require authorization through additional legislation to become effective, Congress and the U.S. presidential administration have each indicated that they will continue to seek new legislative and/or administrative measures to control drug costs. At the state level, legislatures have become increasingly aggressive in passing legislation and implementing regulations designed to control pharmaceutical and biological product pricing, including price or patient reimbursement constraints, discounts, restrictions on certain product access and marketing cost disclosure and transparency measures, and, in some cases, designed to encourage importation from other countries and bulk purchasing.

It is uncertain whether and how future legislation, whether domestic or foreign, could affect prospects for our product candidates or what actions foreign, federal, state, or private payors for health care treatment and services may take in response to any such health care reform proposals or legislation. Adoption of price controls and other cost-containment measures and adoption of more restrictive policies in jurisdictions with existing controls and measures reforms may prevent or limit our ability to generate revenue, attain profitability or commercialize our product candidates.

Moreover, the Drug Supply Chain Security Act imposes new obligations on manufacturers of pharmaceutical products, among others, related to product tracking and tracing, which is being phased in over several years beginning in 2015. Among the requirements of this new legislation, manufacturers will be required to provide certain information regarding the drug product to individuals and entities to which product ownership is transferred, label

drug product with a product identifier, and keep certain records regarding the drug product. The transfer of information to subsequent product owners by manufacturers will eventually be required to be done electronically. Manufacturers will also be required to verify that purchasers of the manufacturers' products are appropriately licensed. Further, under this new legislation, manufacturers will have drug product investigation, quarantine, disposition, and notification responsibilities related to counterfeit, diverted, stolen, and intentionally adulterated products, as well as products that are the subject of fraudulent transactions or which are otherwise unfit for distribution such that they would be reasonably likely to result in serious health consequences or death.

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Coverage and Reimbursement

Sales of our products, if and when approved, will depend, in part, on the extent to which the costs of our products will be covered by third-party payors, such as government healthcare programs, private health insurers and managed care organizations. Third-party payors generally decide which drugs they will cover and establish certain reimbursement levels for such drugs. In particular, in the United States, private health insurers and other third-party payors often provide reimbursement for products and services based on the level at which the government (through the Medicare or Medicaid programs) provides reimbursement for such treatments. Patients who are prescribed treatments for their conditions and providers performing the prescribed services generally rely on third-party payors to reimburse all or part of the associated healthcare costs. Patients are unlikely to use our products unless coverage is provided and reimbursement is adequate to cover a significant portion of the cost of our products. Sales of our product candidates, and those of any future product candidate, will therefore depend substantially on the extent to which the costs of our product candidates, and those of any future product candidate, will be paid by third-party payors. Additionally, the market for our product candidates, and those of any future product candidate, will depend significantly on access to third-party payors' formularies without prior authorization, step therapy, or other limitations such as approved lists of treatments for which third-party payors provide coverage and reimbursement. Additionally, coverage and reimbursement for therapeutic products can differ significantly from payor to payor. One third-party payor's decision to cover a particular medical product or service does not ensure that other payors will also provide coverage for the medical product or service, or will provide coverage at an adequate reimbursement rate. As a result, the coverage determination process will require us to provide scientific and clinical support for the use of our products to each payor separately and will likely be a time-consuming process.

Third-party payors are developing increasingly sophisticated methods of controlling healthcare costs and challenging the prices charged for medical products and services. Additionally, the containment of healthcare costs (including drug prices) has become a priority of federal and state governments. The U.S. government, state legislatures and foreign governments have shown significant interest in implementing cost-containment programs, including price controls, restrictions on reimbursement and requirements for substitution by generic products. Adoption of price controls and cost-containment measures, and adoption of more restrictive policies in jurisdictions with existing controls and measures, could limit our net revenue and results. If these third-party payors do not consider our products to be cost-effective compared to other therapies, they may not cover our products once approved as a benefit under their plans or, if they do, the level of reimbursement may not be sufficient to allow us to sell our products on a profitable basis. Decreases in third-party reimbursement for our products once approved or a decision by a third-party payor to not cover our products could reduce or eliminate utilization of our products and have an adverse effect on our sales, results of operations and financial condition. In addition, state and federal healthcare reform measures have been and 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.

Research and Development

Our research and development expenses totaled $141.4 million, $134.8 million and $76.6 million for the years ended March 31, 2018, 2017 and 2016, respectively.

Employees

As of March 31, 2018, we had 45 full-time employees. As described above under “—Services Agreements with Roivant Sciences, Inc. and Roivant Sciences GmbH,” we rely on the administrative support and research and development services provided by RSI and RSG. Our and ASI's employees are not represented by any collective bargaining unit, and we believe our relations with our employees are good.

Corporate Information

We are an exempted limited company incorporated under the laws of Bermuda on October 31, 2014 under the name Roivant Neurosciences Ltd. We changed our name to Axovant Sciences Ltd. in March 2015. We have six wholly-owned subsidiaries. Axovant Holdings Limited, a direct wholly-owned subsidiary of Axovant Sciences Ltd., was incorporated in England and Wales in August 2016; Axovant Sciences, Inc., a direct wholly-owned subsidiary of Axovant Holdings Limited, was incorporated in Delaware in February 2015; Axovant Sciences GmbH, a direct

wholly-owned subsidiary of Axovant Holdings Limited, was organized in Switzerland in August 2016; Axovant Sciences America, Inc., a direct wholly-owned subsidiary of Axovant Holdings Limited, was incorporated in Delaware in July 2017; Axovant Treasury Holdings, Inc., a direct wholly-owned subsidiary of Axovant Sciences Ltd., was incorporated in Delaware in March 2018; and Axovant Treasury, Inc., a direct wholly-owned subsidiary of Axovant Treasury Holdings, Inc., was incorporated in Delaware in March 2018. Our principal office is located at Suite 1, 3rd Floor, 11-12 St. James's Square, London, United Kingdom SW1Y 4LB, and our telephone number is +44 203 318 9708. Our registered office is located in Bermuda at Clarendon House, 2 Church Street, Hamilton HM11, Bermuda, and its telephone number is +1 (441) 824-8100. We also have business operations in Basel, Switzerland and New York, NY.

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Available Information

Our website is www.axovant.com. The contents of, or information accessible through, our website are not part of this Annual Report on Form 10-K, and our website address is included in this document as an inactive textual reference only. We make our filings with the SEC, including our Annual Report on Form 10-K, Quarterly Reports on Form 10-Q, Current Reports on Form 8-K and all amendments to those reports, available free of charge on our website as soon as reasonably practicable after we file such reports with, or furnish such reports to, the SEC. The public may read and copy the materials we file with the SEC at the SEC's Public Reference Room at 100 F Street, NE, Washington, DC 20549. The public may obtain information on the operation of the Public Reference Room by calling the SEC at 1-800-SEC-0330. Additionally, the SEC maintains an internet site that contains reports, proxy and information statements and other information. The address of the SEC's website is www.sec.gov.

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Item 1A. Risk Factors

You should carefully consider the following risk factors, in addition to the other information contained in this Annual Report on Form 10-K, including the section of this report titled “Management’s Discussion and Analysis of Financial Condition and Results of Operations” and our consolidated financial statements and related notes. The risks and uncertainties described below are not the only ones we face. Additional risks and uncertainties of which we are unaware, or that we currently believe are not material, may also become important factors that adversely affect our business. If any of the events described in the following risk factors and the risks described elsewhere in this report occurs, our business, operating results and financial condition could be seriously harmed and the trading price of our common shares could decline. This Annual Report on Form 10-K also contains forward-looking statements that involve risks and uncertainties. Our actual results could differ materially from those anticipated in the forward-looking statements as a result of factors that are described below and elsewhere in this report. See the section of this report titled "Cautionary Note Regarding Forward-Looking Statements".

Risks Related to Our Business, Financial Position and Capital Requirements

We have a limited operating history and have never generated any product revenues.

We are a clinical-stage biopharmaceutical company with a limited operating history. We were formed in October 2014, and our operations to date have been limited to organizing and staffing our company, raising capital, acquiring drug development programs and preparing for and advancing our existing and former product candidates, intepirdine and nelotanserin, into clinical development. We have not yet demonstrated an ability to successfully complete a large-scale, pivotal clinical trial, obtain marketing approval, manufacture a commercial-scale product, or arrange for a third-party to do so on our behalf, or conduct sales and marketing activities necessary for successful product commercialization. Consequently, we have no meaningful operations upon which to evaluate our business and predictions about our future success or viability may not be as accurate as they could be if we had a longer operating history or a history of successfully developing and commercializing pharmaceutical products.

In addition, we may encounter unforeseen expenses, difficulties, complications, delays and other known and unknown factors. The failure of our Phase 3 MINDSET trial, Phase 2b HEADWAY trial and Phase 2 Gait and Balance trial for intepirdine has required us to reevaluate our future development plans for our product candidates, as well as our business plan more broadly. We may never be successful in developing or commercializing any of our product candidates, including our newly licensed product candidate AXO-Lenti-PD, which remains in early stages of clinical development. If successful in developing and obtaining marketing approval of one of our product candidates, we would need to transition from a company with a product development focus to a company capable of supporting commercial activities. We may not be successful in such a transition.

Our ability to generate revenue and become profitable depends upon our ability to successfully complete the development of our product candidates and other assets in the fields of neurology and psychiatry and to obtain the necessary regulatory approvals for their commercialization. We have never been profitable, have not generated any revenue from product sales, and have no products approved for commercial sale.

Even if we receive regulatory approval for our product candidates, we do not know when those candidates will generate revenue, if at all. Our ability to generate product revenue depends on a number of factors, including our ability to:

- successfully commence and complete clinical trials and obtain regulatory approval for the marketing of our product candidates, including AXO-Lenti-PD;
- set an acceptable price for our product candidates and obtain coverage and adequate reimbursement from third-party payors;
- establish effective sales, marketing and distribution systems for our product candidates;
- add operational, financial and management information systems and personnel, including personnel to support our clinical, manufacturing and planned future commercialization efforts and operations as a public company;
- initiate and continue relationships with third-party manufacturers, including Oxford BioMedica for AXO-Lenti-PD, and have commercial quantities of our product candidates manufactured at acceptable cost and quality levels;
- attract and retain an experienced management and advisory team;
-

achieve broad market acceptance of our products in the medical community and with third-party payors and consumers;

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- launch commercial sales of our products, whether alone or in collaboration with others; and
- maintain, expand and protect our intellectual property portfolio.

Because of the numerous risks and uncertainties associated with product development, we are unable to predict the timing or amount of increased expenses, or when, or if, we will be able to achieve or maintain profitability. Our expenses could increase beyond expectations if we are required by the FDA, European Medicines Agency, or EMA, Japan's Pharmaceutical and Medical Devices Agency, or PMDA, or comparable regulatory authorities in other countries, to perform studies or clinical trials in addition to those that we currently anticipate. Even if our product candidates are approved for commercial sale, we anticipate incurring significant costs associated with their commercial launch. If we cannot successfully execute any one of the foregoing, our business may not succeed and your investment will be adversely affected.

We are in the process of implementing a business plan that may continue to evolve as we integrate our newly licensed product candidate AXO-Lenti-PD and await relevant clinical data for nelotanserin. Our business plan may lead to the initiation of one or more development programs or the execution of one or more transactions that you do not agree with or that you do not perceive as favorable to your investment.

In early 2018, we began a process to review our strategic alternatives, including identifying potential business development opportunities, following the discontinuation of further development of intepirdine in January 2018. Also beginning in early 2018, we undertook a reassessment of our development plans for nelotanserin in various indications and RVT-104, which included an internal portfolio review of RVT-104 in the context of any newly acquired clinical assets. We plan to make a determination of the overall development strategy for nelotanserin once we have reviewed final data from our currently ongoing Phase 2 study of nelotanserin in REM Sleep Behavior Disorder and completed our ongoing comprehensive clinical, regulatory and commercial review.

In June 2018, we announced that we received from Oxford BioMedica a worldwide exclusive license to develop and commercialize AXO-Lenti-PD and its predecessor product ProSavin and related gene therapy products. We initially plan to pursue a strategy to leverage our clinical experience and expertise in neurology and psychiatry to pursue the clinical development and regulatory approval of AXO-Lenti-PD while evaluating overall development strategy for nelotanserin and RVT-104. In addition, we continue to be actively engaged in extensive business development efforts to identify, evaluate and potentially obtain rights to and develop additional therapeutic and gene therapy product candidates that would complement our strategic goals and leverage our competitive advantages.

This business plan requires us to be successful in a number of challenging, uncertain and risky activities, including pursuing development of AXO-Lenti-PD in indications for which we have limited or no human clinical data, identifying promising new assets for development that are available for acquisition or in-license and that fit our strategic focus and, if so identified, negotiating and executing an acquisition or in-license agreement for one or more of those programs on favorable terms, converting early stage gene therapy research efforts into clinical development opportunities, building internal or outsourced gene therapy capabilities and designing and executing a nonclinical and/or clinical development program for any newly acquired product candidates. We may not be successful at one or more of the activities required for us to execute this business plan. We are also continuing to consider other alternatives, including mergers or other transactions involving our company as a whole or other collaboration transactions. We cannot be sure when or if this process will result in any type of transaction. Even if we pursue a transaction, such transaction may not be consistent with our shareholders' expectations or may not ultimately be favorable for our shareholders, either in the shorter or longer term.

Our growth prospects and the future value of our company are primarily dependent on the progress of our ongoing and planned clinical development programs for AXO-Lenti-PD and the outcome of our ongoing business development efforts and pipeline expansion activities, together with the amount of our remaining available cash. The development of AXO-Lenti-PD and the outcome of our ongoing business development efforts and pipeline expansion activities are highly uncertain.

We have only very limited data from small, uncontrolled clinical trials, performed by or on behalf of Oxford BioMedica, regarding the safety and tolerability of ProSavin, as the predecessor drug to AXO-Lenti-PD, in patients with advanced Parkinson's disease, as well as nonclinical in vitro experiments with AXO-Lenti-PD. Prior ProSavin trials were not powered to demonstrate the efficacy of the therapy with statistical significance. Given the information

above, these trials could be underpowered to demonstrate a potential clinical benefit for AXO-Lenti-PD in these indications.

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We may continue to reassess and make changes to our existing development programs and pipeline expansion strategy. Our future plans for our AXO-Lenti-PD development program may be affected by the results of competitors' clinical trials of product candidates addressing Parkinson's disease. Our plans for our business development efforts and pipeline expansion activities may be affected by the results of competitors' ongoing research and development efforts. We may modify, expand or terminate some or all of our development programs, clinical trials or collaborative research programs at any time as a result of new competitive information or as the result of changes to our product pipeline or business development strategy.

We expect that our remaining cash balances will continue to decline as we pursue these development programs, pursue our collaborative research programs, pursue our business development activities and until such time, if any, as we receive additional funding, and the value of our shareholders' investment may decline as a result.

We expect to incur significant losses for the foreseeable future and may never achieve or maintain profitability. Investment in pharmaceutical and biological product development is highly speculative because it entails substantial upfront capital expenditures and significant risk that a product candidate will fail to gain regulatory approval or become commercially viable. We have never generated any revenues, and we cannot estimate with precision the extent of our future losses. We do not currently have any products that are available for commercial sale and we may never generate revenue from selling products or achieve profitability. We expect to continue to incur substantial and increasing losses through the projected commercialization of our product candidates. Our product candidates have not been approved for marketing in the United States or any other jurisdiction, and we may never receive any such approvals. In addition, we recently discontinued further development of our product candidate intepirdine, which was our most progressed product candidate in clinical development. While we have recently in-licensed our new product candidate AXO-Lenti-PD, this product candidate remains in early stages of clinical development. As a result, we are uncertain when or if we will achieve profitability and, if so, whether we will be able to sustain it. Our ability to produce revenue and achieve profitability is dependent on our ability to complete the development of our product candidates, obtain necessary regulatory approvals, and have our product candidates manufactured and successfully marketed and commercialized. We cannot assure you that we will be profitable even if we successfully commercialize our product candidates. If we do successfully obtain regulatory approval to market our product candidates, our revenues will be dependent, in part, upon, among other things, the size of the markets in the territories for which we gain regulatory approval, the number of competitors in such markets, the accepted price for our product candidates and whether we own the commercial rights for that territory. If the indication approved by regulatory authorities is narrower than we expect, or the treatment population is narrowed by competition, physician choice or treatment guidelines, we may not generate significant revenue from sales of our product candidates, even if approved. Even if we do achieve profitability, we may not be able to sustain or increase profitability on a quarterly or annual basis. Failure to become and remain profitable may adversely affect the market price of our common shares and our ability to raise capital and continue operations.

We expect our research and development expenses to be significant as we develop AXO-Lenti-PD for the treatment of Parkinson's disease, as well as nelotanserin for the treatment of multiple aspects of LBD and RVT-104 for the potential treatment of Alzheimer's disease and DLB. In addition, if we obtain regulatory approval for any of our product candidates, we expect to incur increased sales and marketing expenses. As a result, we expect to continue to incur significant and increasing operating losses and negative cash flows for the foreseeable future. These losses have had and will continue to have an adverse effect on our financial position and working capital.

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We may not be successful in our efforts to identify and acquire additional product candidates.

Part of our strategy involves the business development activities of identifying and acquiring novel product candidates, and this aspect of our business has become more important as a result of our discontinuation of our lead development program. The process by which we identify product candidates may fail to yield product candidates for clinical development for a number of reasons, including those discussed in these risk factors and also:

- the process by which we identify and decide to acquire product candidates may not be successful;
- potential product candidates may, on further study, be shown to have harmful side effects or other characteristics that indicate that they are unlikely to be products that will receive marketing approval and achieve market acceptance; or
- potential product candidates may not be effective in treating their targeted diseases.

The process of identifying and acquiring product candidates is highly competitive, and our ability to compete successfully is impacted by the fact that many of the companies with which we compete for these candidates have significantly greater experience, development and commercialization capabilities, name recognition and financial and human resources than we do. Further, our business development efforts are led by our senior executive officers and other management team members and would be significantly impaired if we were to lose the services of any of these executives. The time and resources spent on business development activities may also distract management's attention from our other development and business activities. If we are unable to identify and acquire suitable product candidates for clinical development, this would adversely impact our business strategy and our financial position and share price.

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We are heavily dependent on the success of AXO-Lenti-PD, our key product candidate, which is still in early stages of clinical development, and if it does not receive regulatory approval or is not successfully commercialized, our business may be harmed.

We currently have no products that are approved for commercial sale and may never be able to develop marketable drug products. We expect that a substantial portion of our efforts and expenditures over the next few years will be devoted to AXO-Lenti-PD. Accordingly, our business currently depends heavily on the successful development, regulatory approval and commercialization of this product candidate. We cannot be certain that any of our product candidates will receive regulatory approval or be successfully commercialized even if we receive regulatory approval. The research, testing, manufacturing, labeling, approval, sale, marketing and distribution of drug products and biological products are and will remain subject to extensive regulation by the FDA, the EMA, the PMDA and other comparable regulatory authorities that each have differing regulations. We are not permitted to market our product candidates in the United States or in any foreign countries until they receive the requisite approvals from the FDA or comparable regulatory authorities in other countries. We have not submitted marketing applications to the FDA or foreign regulatory authorities and do not expect to be in a position to do so for the foreseeable future. Obtaining marketing approval is an extensive, lengthy, expensive and inherently uncertain process, and regulatory authorities may delay, limit or deny approval of our product candidates for many reasons, including:

- we may not be able to demonstrate that a product candidate is safe and effective as a treatment for our targeted indications to the satisfaction of the applicable regulatory authorities;
- our BLA, NDA or other key regulatory filings may be delayed or rejected due to issues, including those related to the FDA's Pharmaceutical Quality/CMC guidance, timing of results from supporting studies, database lock, and data conversion, cleaning, and transfer;
- the regulatory authorities may require additional nonclinical studies or registrational studies of the product candidate in Parkinson's disease or other indications, which would increase our costs and prolong our development;
- the results of our clinical trials may not meet the level of statistical or clinical significance required for marketing approval;
- the regulatory authorities may disagree with the number, design, size, conduct or implementation of our clinical trials;
- the contract research organizations, or CROs, that we retain to conduct clinical trials may take actions outside of our control, or otherwise commit errors or breaches of protocols, that materially adversely impact our clinical trials;
- the regulatory authorities may not find the data from nonclinical studies and clinical trials sufficient to demonstrate that the clinical and other benefits of the product candidate outweigh its safety risks;
- the regulatory authorities may disagree with our interpretation of data from our nonclinical studies and clinical trials or may require that we conduct additional studies;
- the regulatory authorities may not accept data generated at our clinical trial sites;
- the regulatory authorities may require, as a condition of approval, limitations on approved labeling or distribution and use restrictions;
- the FDA may require development of a risk evaluation and mitigation strategy, or REMS, as a condition of approval;
- the regulatory authorities may identify deficiencies in the manufacturing processes or facilities of our third-party manufacturers, including Oxford BioMedica, which is expected to be our sole and exclusive supplier of AXO-Lenti-PD until the process is validated or BLA submission for AXO-Lenti-PD, as well as Arena, our sole and exclusive supplier for nelotanserin, or any manufacturer that Arena may engage to manufacture nelotanserin on its behalf; or
- the regulatory authorities may change their approval policies or adopt new regulations.

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The terms of our credit facility place restrictions on our operating and financial flexibility.

In February 2017, we and our subsidiaries entered into a loan and security agreement with Hercules Capital, Inc., or Hercules, for a term loan of $55.0 million, or the Term Loan. We refer to this loan and security agreement, as amended on May 24, 2017 and September 22, 2017, as the Loan Agreement.

The Loan Agreement is secured by substantially all of our property and that of our subsidiaries that are parties to the Loan Agreement, other than intellectual property.

The Loan Agreement subjects us and our subsidiaries to various affirmative and restrictive covenants, including a minimum cash covenant that ceases to apply if we achieve certain clinical development milestones as set forth in the Loan Agreement, a covenant against the occurrence of a "change in control," financial reporting obligations, and certain limitations on the incurrence of indebtedness, liens (including a negative pledge on intellectual property and other assets), investments, distributions (including dividends), collateral, transfers, mergers or acquisitions, taxes, corporate changes, and deposit accounts. Compliance with these covenants may limit our flexibility in operating our business and our ability to take actions that might be advantageous to us and our shareholders.

Additionally, we may be required to repay the entire amount of outstanding indebtedness under the Term Loan in cash if we fail to stay in compliance with our covenants or suffer some other event of default under the Loan Agreement. Under the Loan Agreement, an event of default will occur if, among other things: we fail to make payments under the Loan Agreement; we breach any of our covenants under the Loan Agreement, subject to specified cure periods with respect to certain breaches; there occurs an event that has a material adverse effect on (i) our business, operations, properties, assets or financial condition, (ii) our ability to perform or satisfy our obligations under the Loan Agreement as they become due or Hercules's ability to enforce its rights or remedies with respect to our obligations under the Loan Agreement, or (iii) the collateral or liens securing our obligations under the Loan Agreement; 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 Hercules to accelerate the maturity of such indebtedness or that could have a material adverse effect 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 that case, we may be required to delay, limit, reduce or terminate our clinical development efforts or grant to others rights to develop and market product candidates that we would otherwise prefer to develop and market ourselves. Hercules could also exercise its rights as collateral agent to take possession and dispose of the collateral securing the Term Loan for its benefit, which collateral includes all of our property other than our intellectual property. Our business, financial condition and results of operations could be substantially harmed as a result of any of these events.

We will require additional capital to fund our operations, and if we fail to obtain necessary financing, we may not be able to complete the development and commercialization of our product candidates.

We expect to spend substantial amounts to complete the development of, seek regulatory approvals for and commercialize our product candidates. These expenditures will include costs payable to Oxford BioMedica under the Oxford BioMedica Agreement as well as Arena under the Arena Development Agreement. Under the terms of these agreements, we are obligated to make significant cash payments upon the achievement of specified development, regulatory and sales performance milestones, as well as payments in connection with the sale of resulting products and the manufacture and supply of our product candidates for commercial purposes.

We will require additional capital to complete the development and potential commercialization of our product candidates, particularly AXO-Lenti-PD, which remains in early stages of clinical development. If we are unable to raise capital when needed or on acceptable terms, we could be forced to delay, reduce or eliminate our development program or any future commercialization efforts. In addition, attempting to secure additional financing may divert the time and attention of our management from day-to-day activities and harm our product candidate development efforts.

We believe our existing cash resources will be sufficient to meet our financial needs for at least the next 12 months. This estimate is based on assumptions that may prove to be wrong, and we could use our available capital resources sooner than we currently expect. Because the length of time and activities associated with successful development of our product candidates is highly uncertain, we are unable to estimate the actual funds we will require for development and any approved marketing and commercialization activities. Our future funding requirements, both near and

long-term, will depend on many factors, including, but not limited to:

- the progress, timing, costs and results of our clinical trials of our product candidates;

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- the outcome, timing and cost of meeting regulatory requirements established by the FDA, the EMA, or the PMDA, and other comparable foreign regulatory authorities;
- the cost of filing, prosecuting, defending and enforcing our patent claims and other intellectual property rights;
- the cost of defending potential intellectual property disputes, including patent infringement actions brought by third parties against us or our product candidates or any future product candidates;
- the effect of competing technological and market developments;
- the cost and timing of completion of commercial-scale manufacturing activities;
- the cost of establishing sales, marketing and distribution capabilities for our product candidates in regions where we choose to commercialize our products on our own; and
- the initiation, progress, timing and results of our commercialization of our product candidates, if approved for commercial sale.

We cannot be certain that additional funding will be available on acceptable terms, or at all. If we are unable to raise additional capital in sufficient amounts or on terms acceptable to us, we may have to significantly delay, scale back or discontinue the development or commercialization of our product candidates or potentially discontinue operations.

We may be required to make significant payments to third parties under the agreements pursuant to which we acquired our product candidates.

In October 2015, we acquired the rights to nelotanserin and assumed the obligations under the Arena Development Agreement; in August 2016, we entered into a license agreement with Qaam for RVT-104; and in June 2018, we entered into a license agreement with Oxford BioMedica for AXO-Lenti-PD. Under these agreements, we are subject to significant obligations, including payment obligations upon achievement of specified milestones and payments based on product sales, as well as other material obligations. For example, under our agreement with Oxford Biomedica, we could be obligated to make payments totaling up to $55.0 million upon the achievement of specified development milestones and $757.5 million upon the achievement of specified regulatory and sales milestones. In addition, we will also be obligated to pay Oxford BioMedica a tiered royalty percentage ranging from 7% to 10% based on yearly aggregate net sales of the Gene Therapy Products licensed under the agreement. If these payments become due under the terms of the agreements, we may not have sufficient funds available to meet our obligations and in which case our development efforts would be substantially harmed. Further, failure to make these payments or to meet our other material obligations may result in our counterparties pursuing remedies under those agreements that could adversely affect our operations.

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

We expect that significant additional capital will be needed in the future to continue our planned operations. Until such time, if ever, as we can generate substantial product revenues, we expect to finance our cash needs through a combination of equity offerings, debt financings, strategic alliances and license and development agreements in connection with any collaborations. We do not have any committed external source of funds. To the extent that we raise additional capital by issuing equity securities, including pursuant to our “shelf” registration statement filed with the SEC, our existing shareholders’ ownership may experience substantial dilution, and the terms of these securities may include liquidation or other preferences that adversely affect your rights as a common shareholder. Additional debt financing or preferred equity financing, if available, may involve agreements that include covenants further limiting or restricting our ability to take specific actions, such as incurring additional debt, making capital expenditures or declaring dividends.

If we raise additional funds through collaborations, strategic alliances or marketing, distribution or licensing arrangements with third parties, we may have to relinquish valuable rights to our technologies, future revenue streams, research programs or product candidates or grant licenses on terms that may not be favorable to us. If we are unable to raise additional funds through equity or debt financings when needed, we may be required to delay, limit, reduce or terminate our product development or future commercialization efforts or grant rights to develop and market product candidates that we would otherwise develop and market ourselves.

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We currently have a limited number of employees who are employed by our wholly owned subsidiaries and we rely on RSI and RSG, as well as Oxford BioMedica, to provide various administrative, research and development and other services.

As of March 31, 2018, we had 45 employees. We also rely in part on the administrative support and research and development services provided by our affiliates, RSI and RSG, wholly owned subsidiaries of RSL, pursuant to our amended and restated services agreements with RSI and RSG, as well as limited personnel support from Oxford BioMedica under the Oxford BioMedica Agreement. Personnel and support staff that provide services to us under these services agreements are not required to, and we do not expect that they will, have as their primary responsibility the management and administration of our business or act exclusively for us. Under these services agreements, RSI and RSG have the discretion to determine which of their employees will perform services for us.

RSI and RSG have limited financing and accounting and other resources. If either RSI or RSG fails to perform its obligations in accordance with the terms of the services agreements or to effectively manage our administrative, research and development or other services, it could be difficult for us to operate our business and our business could be harmed. In the event of a default under or termination of the services agreements, we may be unable to contract with substitute service providers on similar terms in a timely fashion or at all, and the costs of substituting service providers may be substantial. In addition, in light of RSI's and RSG's familiarity with our assets, a substitute service provider may not be able to provide the same level of service due to lack of pre-existing knowledge or synergies. Any termination of our relationship with RSI or RSG, and any delay in appointing or finding a suitable replacement provider, if one exists, could make it difficult for us to operate our business.

We may not be able to manage our business effectively if we or RSI or RSG are unable to attract and retain key personnel. In addition, if we are unable to effectively transition and integrate our new executive officers and solidify and implement our updated business strategy, our business and financial performance could be adversely affected.

We may not be able to attract or retain qualified management and commercial, scientific and clinical personnel due to the intense competition for qualified personnel among biotechnology, pharmaceutical and other businesses. If we are not able to attract and retain 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.

Our Principal Executive Officer and Principal Operating Officer recently resigned to pursue new opportunities, and in February 2018, we initiated a corporate realignment to focus our efforts and resources on our ongoing and future programs that included a reduction in our workforce and a transfer of certain employees to affiliates. In light of these and other changes, several members of our senior management team are relatively new to Axovant. Our financial performance will depend in significant part on our senior management team and key employees, including new members of management with expertise in the gene therapy development field. In addition, our corporate realignment may have impacted employee morale and led, and may continue to lead, to higher rates of voluntary attrition compared to prior years. We are highly dependent on the skills and leadership of our management team, as well as the key employees of RSI and RSG that provide services to us through our services agreements. Our senior management and key employees, as well as those of RSI and RSG, may terminate their position with us or their employment with RSI or RSG, respectively, at any time. Further, neither RSI nor RSG is required pursuant to the services agreements to maintain the employment of any of its key employees on our behalf or to cause those individuals to provide services to us.

If we lose one or more members of our senior management team or key employees, or if RSI or RSG loses one or more members of their senior management teams or key employees, our ability to successfully implement our business strategy could be seriously harmed. Replacing these individuals may be difficult, cause disruption, and may take an extended period of time because of the limited number of individuals in our industry with the breadth of skills and experience required to develop, gain regulatory approval of and commercialize products successfully.

Competition to hire from this limited pool is intense, and we may be unable to hire, train, retain or motivate additional key personnel. We do not maintain "key person" insurance for any of our executives or other employees.

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We will need to expand our organization, and we may experience difficulties in managing this growth, which could disrupt our operations.

We expect to hire, either directly or through ASI, ASG or ASA, additional employees for our managerial, clinical, scientific and engineering, operational, sales and marketing teams. We may have operational difficulties in connection with identifying, hiring and integrating new personnel. Future growth would impose significant additional responsibilities on our management, including the need to identify, recruit, maintain, motivate and integrate additional employees, consultants and contractors. Also, our management may need to divert a disproportionate amount of its attention away from our day-to-day activities, including development of product candidates, and devote a substantial amount of time to managing these growth activities. If our management is unable to effectively manage our growth, our expenses may increase more than expected, our ability to generate and grow revenues could be reduced, and we may not be able to implement our business strategy. We may not be able to effectively manage the expansion of our operations across our entities, which may result in weaknesses in our infrastructure, give rise to operational mistakes, loss of business opportunities, loss of employees and reduced productivity among remaining employees. Our future financial performance and our ability to commercialize our product candidates and compete effectively will depend, in part, on our ability to effectively manage any future growth.

Many of the other pharmaceutical companies that we compete against for qualified personnel and consultants have greater financial and other resources, different risk profiles and a longer history in the industry than we do. They also may provide more diverse opportunities and better chances for career advancement. Some of these characteristics may be more appealing to high-quality candidates and consultants than what we have to offer. If we are unable to continue to attract and retain high-quality personnel and consultants, the rate and success at which we can discover and develop product candidates and our business will be limited.

Our employees, independent contractors, principal investigators, consultants, commercial collaborators, service providers and other vendors, or those of our affiliates, may engage in misconduct or other improper activities, including noncompliance with regulatory standards and requirements, which could have an adverse effect on our results of operations.

Our employees and contractors, including principal investigators, consultants, commercial collaborators, manufacturers, service providers and other vendors, or those of our affiliates, may engage in fraudulent or other illegal activity. Misconduct by these parties could include intentional, reckless and/or negligent conduct or other unauthorized activities that violate the laws and regulations, including those of the FDA and other similar regulatory bodies that require the reporting of true, complete and accurate information; manufacturing standards; federal, state and foreign healthcare fraud and abuse laws and data privacy; or laws that require the true, complete and accurate reporting of financial information or data. In particular, sales, marketing and other business arrangements in the healthcare industry are subject to extensive laws intended to prevent fraud, kickbacks, self-dealing, bribery, corruption, antitrust violations, and other abusive practices. These laws may restrict or prohibit a wide range of business activities, including research, manufacturing, distribution, pricing, discounting, marketing and promotion, sales commission, customer incentive programs and other business arrangements. Activities subject to these laws also involve the improper use or misrepresentation of information obtained in the course of clinical trials the creation of fraudulent data in nonclinical studies or clinical trials or illegal misappropriation of drug product, which could result in regulatory sanctions and serious harm to our reputation. It is not always possible to identify and deter employee or third-party misconduct, and the precautions we take to detect and prevent this activity may not be effective in controlling unknown or unmanaged risks or losses or in protecting us from governmental investigations or other actions or lawsuits stemming from a failure to be in compliance with such laws or regulations. Additionally, we are subject to the risk that a person or government agency could allege such fraud or other misconduct, even if none occurred. If our employees, independent contractors, principal investigators, consultants, commercial collaborators, service providers or other vendors, or those of our affiliates, are alleged or found to be in violation of any such regulatory standards or requirements, or become subject to a corporate integrity agreement or similar agreement and curtailment of our operations, it could have a significant impact on our business and financial results, including the imposition of significant civil, criminal and administrative penalties, damages, monetary fines, suspension or delay in clinical trials, possible exclusion from participation in Medicare, Medicaid and other federal healthcare programs,

FDA debarment, contractual damages, reputational harm, diminished profits and future earnings, additional reporting requirements and oversight, any of which could adversely affect our ability to operate our business and our results of operations.

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International expansion of our business exposes us to business, regulatory, political, operational, financial and economic risks associated with doing business in various jurisdictions globally.

Our business strategy incorporates international expansion, including establishing and maintaining operations and certain key functions in various jurisdictions around the world and establishing and maintaining relationships with distributors and manufacturers globally. Doing business internationally involves a number of risks, including:

- multiple, conflicting and changing laws and regulations such as tax laws, export and import restrictions, employment laws, anti-bribery and anti-corruption laws, regulatory requirements and other governmental approvals, permits and licenses;
- failure by us or our distributors to obtain appropriate licenses or regulatory approvals for the sale or use of our product candidates, if approved, in various countries;
- difficulties in managing foreign operations;
- complexities associated with managing multiple payor-reimbursement regimes or self-pay systems;
- financial risks, such as longer payment cycles, difficulty enforcing contracts and collecting accounts receivable and exposure to foreign currency exchange rate fluctuations;
- reduced protection for intellectual property rights;
- reduced protection of contractual rights in the event of bankruptcy or insolvency of the other contracting party;
- natural disasters, political and economic instability, including wars, terrorism and political unrest, outbreak of disease, boycotts, curtailment of trade and other business restrictions;
- failure to comply with foreign laws, regulations, standards and regulatory guidance governing the collection, use, disclosure, retention, security and transfer of personal data, including the European Union General Data Privacy Regulation ("GDPR"), which introduces strict requirements for processing personal data of individuals within the European Union; and
- failure to comply with the United Kingdom Bribery Act 2010, or UK Bribery Act, and similar antibribery and anticorruption laws in other jurisdictions, and the Foreign Corrupt Practices Act, including its books and records provisions and its anti-bribery provisions, including by failing to maintain accurate information and control over sales and distributors' activities.

Any of these risks, if encountered, could significantly harm our future international expansion and operations and, consequently, negatively impact our financial condition, results of operations and cash flows.

Our business and operations would suffer in the event of system failures, security breaches or cyber-attacks.

Our computer systems, as well as those of various third parties on which we rely, including those of RSL and its affiliates and our CROs and other contractors, consultants, and law and accounting firms, may sustain damage from computer viruses, unauthorized access, data breaches, phishing attacks, cybercriminals, natural disasters, terrorism, war and telecommunication and electrical failures. We rely on our third-party providers to implement effective security measures and identify and correct for any such failures, deficiencies or breaches. The risk of a security breach or disruption, particularly through cyber-attacks or cyber intrusion, including by computer hackers, foreign governments, and cyber terrorists, has generally increased as the number, intensity and sophistication of attempted attacks and intrusions from around the world have increased. We have experienced phishing attacks in the past, which have not had a material impact on our operations, however, we may in the future experience material system failures or security breaches that could cause interruptions in our operations, or result in a material disruption of our drug development programs. For example, the loss of nonclinical or clinical trial data from completed, ongoing or planned trials could result in delays in our regulatory approval efforts and significantly increase our costs to recover or reproduce the data. To the extent that any disruption or security breach were to result in a loss of or damage to our data or applications, or inappropriate disclosure of personal, confidential or proprietary information, we could incur liability and the further development of our product candidates could be delayed.

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The failure to successfully implement an enterprise resource planning system could adversely impact our business and results of operations.

RSI and RSG commenced the implementation of a company-wide enterprise resource planning, or ERP, system to upgrade certain existing business, operational, and financial processes, upon which we rely. ERP implementations are complex and time-consuming projects that require transformations of business and financial processes in order to reap the benefits of the ERP system; any such transformation involves risk inherent in the conversion to a new computer system, including loss of information and potential disruption to normal operations. Additionally, if the ERP system is not effectively implemented as planned, or the system does not operate as intended, the effectiveness of our internal controls over financial reporting could be adversely affected or our ability to assess those controls adequately could be delayed. Significant delays in documenting, reviewing and testing our internal control could cause us to fail to comply with our SEC reporting obligations related to our management's assessment of our internal control over financial reporting. In addition, if we experience interruptions in service or operational difficulties and are unable to effectively manage our business during or following the implementation of the ERP system, our business and results of operations could be harmed.

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

The use of our product candidates in clinical trials and the sale of any products for which we obtain marketing approval exposes us to the risk of product liability claims. Product liability claims might be brought against us by consumers, health care providers, pharmaceutical companies or others selling or otherwise coming into contact with our products. On occasion, large judgments have been awarded in class action lawsuits based on drugs that had unanticipated adverse effects. If we are not successful in defending ourselves against product liability claims, we could incur substantial liability and costs. In addition, regardless of merit or eventual outcome, product liability claims may result in:

- impairment of our business reputation and significant negative media attention;
- withdrawal of participants from our clinical trials;
- significant costs to defend related litigation;
- distraction of management’s attention from our primary business;
- substantial monetary awards to patients or other claimants;
- inability to commercialize our product candidates or any future product candidate;
- product recalls, withdrawals or labeling, marketing or promotional restrictions;
- decreased demand for our product candidates or any future product candidate, if approved for commercial sale; and
- loss of revenue.

The product liability insurance we currently carry, and any additional product liability insurance coverage we acquire in the future, may not be sufficient to reimburse us for any expenses or losses we may suffer. Moreover, insurance coverage is becoming increasingly expensive and in the future we may not be able to maintain insurance coverage at a reasonable cost or in sufficient amounts to protect us against losses due to liability. A successful product liability claim or series of claims brought against us could cause our share price to decline and, if judgments exceed our insurance coverage, could adversely affect our results of operations and business, including preventing or limiting the commercialization of any product candidates we develop.

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If we fail to comply with applicable U.S. and foreign privacy and data protection laws and regulations, we may be subject to liabilities that adversely affect our business, operations and financial performance.

Our information security systems are subject to laws and regulations requiring that we take measures to protect the privacy and security of certain information we gather and use in our business. For example, HIPAA, and its implementing regulations impose, among other requirements, certain regulatory and contractual requirements regarding the privacy and security of personal health information. In addition to HIPAA, numerous other federal and state laws, including, without limitation, state security breach notification laws, state health information privacy laws and federal and state consumer protection laws, govern the collection, use, and storage of personal information.

We may also be subject to or affected by foreign laws and regulation, including regulatory guidance, governing the collection, use, disclosure, security, transfer and storage of personal data, such as information that we collect about patients and healthcare providers in connection with clinical trials and our other operations in the U.S. and abroad. The global legislative and regulatory landscape for privacy and data protection continues to evolve, and implementation standards and enforcement practices are likely to remain uncertain for the foreseeable future. This evolution may create uncertainty in our business, result in liability or impose additional costs on us. The cost of compliance with these laws, regulations and standards is high and is likely to increase in the future.

It is possible that each of these privacy laws may be interpreted and applied in a manner that is inconsistent with our practices. Any failure or perceived failure by us to comply with federal, state, or foreign laws or self-regulatory standards could result in negative publicity, diversion of management time and effort and proceedings against us by governmental entities or others. In many jurisdictions, enforcement actions and consequences for noncompliance are rising. As we continue to expand into other foreign countries and jurisdictions, we may be subject to additional laws and regulations that may affect how we conduct business.

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Risks Related to Clinical Development, Regulatory Approval and Commercialization

Clinical trials are very expensive, time-consuming and difficult to design and implement and involve an uncertain outcome.

Our product candidates are still in development and will require extensive clinical testing before we are prepared to submit an application for marketing approval to regulatory authorities. We cannot predict with any certainty if or when we might submit any such application for regulatory approval for our product candidates or whether any such application will be approved by the applicable regulatory authority in our target markets. Human clinical trials are very expensive and difficult to design and implement, in part because they are subject to rigorous regulatory requirements. For instance, regulatory authorities may not agree with our proposed endpoints for any clinical trials of our product candidates, which may delay the commencement of our clinical trials. The clinical trial process is also time-consuming. We estimate that clinical trials of our product candidates will take at least several years to complete. Furthermore, failure can occur at any stage of the trials, and we could encounter problems that cause us to abandon or repeat clinical trials. Product candidates in later stages of clinical trials may fail to show the desired safety and efficacy traits despite having progressed through nonclinical studies and initial clinical trials, and the results of smaller nonclinical or early clinical trials therefore may not be predictive of the results of large scale or later-stage clinical programs. For example, in January 2018, we announced that intepirdine did not meet its primary efficacy endpoints in the Phase 2B HEADWAY and pilot Phase 2 Gait and Balance studies. In light of the data from these studies, we discontinued our intepirdine program. Likewise, there can be no assurance that the results of studies conducted by collaborators or other third parties will be viewed favorably or are indicative of our own future study results. A number of companies in the biopharmaceutical industry, and especially in the neurology field, have suffered significant setbacks in advanced clinical trials due to lack of efficacy or adverse safety profiles, notwithstanding promising results in earlier trials, and in the regulatory approval process. For example, in August 2017, Acorda Therapeutics received a refusal to file letter from the FDA regarding its NDA for INBRIJA, an investigational treatment for symptoms of OFF episodes in patients with Parkinson’s disease taking a carbidopa/levodopa regimen. Our product candidate AXO-Lenti-PD is in early stages of development. The outcome of nonclinical testing and early clinical trials may not be predictive of the success of later stage clinical trials, interim results of a clinical trial do not necessarily predict final results and results from one completed clinical trial may not be replicated in a subsequent clinical trial with a similar study design. The Phase 1/2 clinical trial of ProSavin conducted by Oxford BioMedica was conducted with a small patient population and was not blinded or placebo-controlled, making it difficult to predict whether the favorable results that we observed in such trials will be repeated in larger and more advanced clinical trials.

The commencement and completion of clinical trials may be delayed by several factors, including:

- failure to obtain regulatory approval to commence a trial;
- unforeseen safety issues;
- determination of dosing issues;
- lack of effectiveness during clinical trials;
- inability to reach agreement on acceptable terms with prospective CROs and clinical trial sites;
- slower than expected rates of patient recruitment or failure to recruit suitable patients to participate in a trial;
- changes in or modifications to clinical trial design;
- failure to manufacture or obtain supply of sufficient quantities of a drug candidate or placebo or failure to obtain sufficient quantities of concomitant medication for use in clinical trials;
- inability to monitor patients adequately during or after treatment;
- inability or unwillingness of medical investigators to follow our clinical and other applicable protocols;
- failure to establish sufficient number of clinical trial sites; or
- clinical sites or others deviating from trial protocol, inappropriately unblinding results, or dropping out of a trial.

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Further, by way of example, we, the FDA or an institutional review board, or IRB, at a clinical trial site may suspend our clinical trials at any time if it appears that we or our collaborators are failing to conduct a trial in accordance with regulatory requirements, including the FDA's current Good Clinical Practice, or GCP, regulations, that we are exposing participants to unacceptable health risks, or if the FDA finds deficiencies in our IND submissions or the conduct of these trials. Therefore, we cannot predict with any certainty the schedule for commencement and completion of clinical trials. If we experience delays in the commencement or completion of our clinical trials, or if we terminate a clinical trial prior to completion, the commercial prospects of our product candidates could be harmed, and our ability to generate revenues may be delayed. In addition, any delays in our clinical trials could increase our costs, cause a drop in our share price, slow down the approval process and jeopardize our ability to commence product sales and generate revenues. Any of these occurrences may harm our business, financial condition and results of operations.

Moreover, principal investigators for our clinical trials may serve as scientific advisors or consultants to us from time to time and receive compensation in connection with such services. Under certain circumstances, we may be required to report some of these relationships to the FDA. The FDA may conclude that a financial relationship between us and a principal investigator has created a conflict of interest or otherwise affected interpretation of the study. The FDA may therefore question the integrity of the data generated at the applicable clinical trial site and the utility of the clinical trial itself may be jeopardized. This could result in a delay in approval, or rejection, of our marketing applications by the FDA and may ultimately lead to the denial of marketing approval of one or more of our product candidates.

In addition, we acquired worldwide rights to our product candidates and were not involved in their development prior to such acquisitions. Any difficulties we experience in transitioning and integrating such product candidates into our operations may result in delays in clinical trials as well as problems in our development efforts and regulatory filings, particularly if we do not receive all of the necessary drug products, information, reports and data from third parties in a timely manner. More particularly, we have had no involvement with or control over the nonclinical and clinical development of our product candidates prior to acquiring the rights to them. We are dependent on predecessors including Oxford BioMedica and Arena, having conducted such research and development in accordance with the applicable protocols, legal, regulatory and scientific standards, having accurately reported the results of all clinical trials and other research conducted prior to our acquisition of the product candidates, having correctly collected and interpreted the data from these trials and other research and having supplied us with complete information, data sets and reports required to adequately demonstrate the results reported through the date of our acquisition of these assets. In addition, we have limited data regarding the safety, tolerability and efficacy of AXO-Lenti-PD for the treatment of Parkinson's disease, and we have not previously conducted development activities for a biological product candidate. Problems related to predecessors including Oxford BioMedica and Arena as well as our limited available data for AXO-Lenti-PD in the treatment of Parkinson's disease could result in increased costs and delays in the development of our product candidates, which could adversely affect our ability to generate future revenues.

Enrollment and retention of patients in clinical trials is an expensive and time-consuming process and could be made more difficult or rendered impossible by multiple factors outside our control.

We may encounter delays in enrolling, or be unable to enroll, a sufficient number of patients to complete any of our clinical trials, and even once enrolled we may be unable to retain a sufficient number of patients to complete any of our trials. Patient enrollment and retention in clinical trials depends on many factors, including the size of the patient population, the nature of the trial protocol, the effectiveness of our patient recruitment efforts, the existing body of safety and efficacy data with respect to the study drug, the perceived risks and benefits of lentiviral vector gene therapy approaches for the treatment of neurological diseases, the number and nature of competing treatments and ongoing clinical trials of competing drugs for the same indication, including more traditional approaches for the treatment of Parkinson's disease, perceived risk of the delivery procedure, patients with pre-existing antibodies to the lentiviral vector that preclude their participation in any trial, the proximity of patients to clinical sites and the eligibility criteria for the study. Furthermore, the negative results we have reported in clinical trials to date and any other negative results we may report in clinical trials of any of our product candidates in the future may make it difficult or impossible to recruit and retain patients in other clinical trials of those product candidates. Similarly,

negative results reported by our competitors about their drug candidates may negatively affect patient recruitment in our clinical trials. Delays or failures in planned patient enrollment or retention may result in increased costs, program delays or both, which could have a harmful effect on our ability to develop our product candidates, or could render further development impossible. In addition, we expect to rely on CROs and clinical trial sites to ensure proper and timely conduct of our future clinical trials and, while we intend to enter into agreements governing their services, we will be limited in our ability to compel their actual performance.

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We face significant competition from other biotechnology and pharmaceutical companies, and our operating results will suffer if we fail to compete effectively.

Drug development, particularly in the gene therapy field, is highly competitive and subject to rapid and significant technological advancements. As a significant unmet medical need exists in the neurology field, particularly for the treatment of Parkinson's disease and Alzheimer's disease, there are several large and small pharmaceutical companies focused on delivering therapeutics for the treatment of these diseases. Further, it is likely that additional drugs will become available in the future for the treatment of our target indications.

We consider our most direct competitor with respect to AXO-Lenti-PD to be Voyager Therapeutics, which is developing VY-AADC, a gene therapy product candidate for the treatment of advanced Parkinson's disease. VY-AADC delivers the AADC gene, one of the three genes contained in AXO-Lenti-PD, via an Adeno-Associated Virus ("AAV virus-based vector"). Voyager anticipates entering a Phase 3 study in mid-2018. Agilis Biotherapeutics is developing AGIL-AADC, another AAV virus-based vector gene therapy that delivers the AADC gene, for the treatment of AADC deficiency, a rare disorder that involves loss of AADC gene function. In addition, DBS (Deep Brain Stimulation) is approved for treating Parkinson's disease and is marketed by multiple device manufacturers, including Medtronic, Abbott and Boston Scientific. DBS treatment involves permanent placement of hardware in the brain via stereotactic neurosurgery and may require follow-up adjustments or even invasive device replacements. Another surgical approach is Abbvie's Duopa which is delivered via a port implanted in the abdominal wall. Further efforts are also underway to develop new improved formulations of L-dopa, including Acorda's Inbrija and Mitsubishi Tanabe's ND0612. Adjunct therapies are also being developed or have recently been approved to supplement L-dopa therapy, including Sunovion's sublingual apopmorphine and Adamas Pharmaceuticals' GoCovri. Several companies are also trying to develop other disease modifying therapies that could prevent the progression of Parkinson's disease. Examples of these early stage efforts include Denali Therapeutics' LRRK2 inhibitors and anti-alpha synuclein antibodies from Prothena/Roche and Biogen, as well as Prevail Therapeutics' pipeline of AAV-based therapeutics targeting lysosomal dysfunction. We consider our most direct competitor with respect to nelotanserin to be Acadia Pharmaceuticals, which is marketing and developing pimavanserin, a 5-HT_{2A} receptor inverse agonist that received FDA approval in April 2016 for the treatment of hallucinations and delusions associated with Parkinson's disease psychosis. We believe the FDA approval of pimavanserin adds further validation to the therapeutic relevance of 5-HT_{2A} as a potential target for the treatment of visual hallucinations. Many of our existing or potential competitors have substantially greater financial, technical and human resources than we do and significantly greater experience in the discovery and development of product candidates, as well as in obtaining regulatory approvals of those product candidates in the United States and in foreign countries. Our current and potential future competitors also have significantly more experience commercializing drugs, particularly gene therapy and other biological products, that have been approved for marketing. Mergers and acquisitions in the pharmaceutical and biotechnology industries could result in even more resources being concentrated among a small number of our competitors.

We will face competition from other drugs or from other non-drug products currently approved or that will be approved in the future in the neurology field, including for the treatment of Parkinson's disease. Therefore, our ability to compete successfully will depend largely on our ability to:

- develop and commercialize drugs that are superior to other products in the market;
- demonstrate through our clinical trials that our product candidates are differentiated from existing and future therapies;
- attract qualified scientific, product development and commercial personnel;
- obtain patent or other proprietary protection for our medicines;
- obtain required regulatory approvals;
- obtain coverage and adequate reimbursement from, and negotiate competitive pricing with, third-party payors; and
- successfully collaborate with pharmaceutical companies in the discovery, development and commercialization of new medicines.

The availability of our competitors' products could limit the demand, and the price we are able to charge, for any product candidate we develop. The inability to compete with existing or subsequently introduced drugs would have an

adverse impact on our business, financial condition and prospects.

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Established pharmaceutical companies may invest heavily to accelerate discovery and development of novel compounds or to in-license novel compounds that could make our product candidates less competitive. In addition, any new product that competes with an approved product must demonstrate compelling advantages in efficacy, convenience, tolerability and safety in order to overcome price competition and to be commercially successful. Accordingly, our competitors may succeed in obtaining patent protection, discovering, developing, receiving regulatory and marketing approval for or commercializing drugs before we do, which would have an adverse impact on our business and results of operations.

If we are not able to obtain required regulatory approvals, we will not be able to commercialize our product candidates, and our ability to generate revenue will be materially impaired.

The activities associated with the development and commercialization of our product candidates, including their design, research, testing, manufacture, safety, efficacy, recordkeeping, labeling, packaging, storage, approval, advertising, promotion, sale and distribution, are subject to comprehensive regulation by the FDA and other regulatory agencies in the United States and by the EMA, the PMDA and similar regulatory authorities outside the United States. Failure to obtain marketing approval for our product candidates will prevent us from commercializing them. We have not received approval from regulatory authorities to market any product candidate in any jurisdiction, and we will need to complete pivotal clinical trials successfully for our product candidates before we can submit any application for regulatory approval. It is possible that our product candidates in the future will never obtain the appropriate regulatory approvals necessary for us to commence product sales.

We expect to rely on third-party CROs and consultants to assist us in filing and supporting the applications necessary to gain marketing approvals. Securing marketing approval requires the submission of extensive nonclinical and clinical data and supporting information for our product candidates to regulatory authorities for each therapeutic indication to establish safety and efficacy of the product candidate for that indication. Securing marketing approval also requires the submission of information about the product manufacturing process to, and inspection of manufacturing facilities by, the regulatory authorities. Delays or errors in the submission of applications for marketing approval or issues, including those related to gathering the appropriate data and the inspection process, may ultimately delay or affect our ability to obtain regulatory approval, commercialize our product candidates and generate product revenues.

Our product candidates may cause adverse effects or have other properties that could delay or prevent their regulatory approval or limit the scope of any approved label or market acceptance.

Adverse events caused by our product candidates or that of adjuncts could cause us, other reviewing entities, clinical trial sites or regulatory authorities to interrupt, delay or halt clinical trials and could result in the denial of regulatory approval. If an unacceptable frequency or severity of adverse events are reported in our clinical trials for our product candidates or any future product candidates, our ability to obtain regulatory approval for such product candidates may be negatively impacted. The laws and regulations governing controlled substances could limit commercialization of our product candidates, and failure to comply with those laws and regulations could also result in adverse regulatory, legal, and operational consequences.

In particular, there have been several significant adverse side effects in gene therapy treatments in the past, including reported cases of leukemia in trials using earlier generation viral vectors. Gene therapy is still a relatively new approach to disease treatment and additional adverse side effects could develop. Possible adverse side effects that could occur with treatment with gene therapy products include an immunologic reaction early after administration which could substantially limit the effectiveness of the treatment or represent safety risks for patients. Another traditional safety concern for gene therapies using viral vectors has been the possibility of insertional mutagenesis by the vectors, leading to malignant transformation of transduced cells. Many times, side effects are only detectable after investigational products are tested in larger scale, pivotal clinical trials or, in some cases, after they are made available to patients on a commercial scale after approval. If additional clinical experience indicates that AXO-Lenti-PD or any other product candidate has side effects or causes serious or life-threatening side effects, the development of the product candidate may fail or be delayed, or, if the product candidate has received regulatory approval, such approval may be revoked or limited.

Furthermore, if any of our products are approved and then cause serious or unexpected side effects, a number of potentially significant negative consequences could result, including:

- regulatory authorities may withdraw their approval of the product or require a REMS to impose restrictions on its distribution or other risk management measures;
- regulatory authorities may require the addition of labeling statements, such as warnings or contraindications;
- we may be required to change the way the product is administered or to conduct additional clinical trials;

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- we could be sued and held liable for harm caused to patients;
- we could elect to discontinue the sale of our product; and
- our reputation may suffer.

Any of these events could prevent us from achieving or maintaining market acceptance of the affected product candidate and could substantially increase the costs of commercializing our product candidates.

Our lentiviral-based gene therapy product candidate AXO-Lenti-PD is based on a novel technology, which makes it difficult to predict the time and cost of product candidate development and of subsequently obtaining regulatory approval.

We expect to concentrate our research and development efforts on our lentiviral-based gene therapy candidate AXO-Lenti-PD. The use of gene therapy in the treatment of Parkinson's disease is novel. There can be no assurance that we will not experience problems or delays in developing new product candidates and that such problems or delays will not cause unanticipated costs, or that any such development problems can be solved. We may also experience delays in developing a sustainable, reproducible and scalable manufacturing process or transferring that process from Oxford BioMedica, which may prevent us from completing our clinical studies or commercializing our products on a timely or profitable basis, if at all.

In addition, the clinical trial requirements of the FDA and other foreign regulatory authorities and the criteria these regulators use to determine the safety and efficacy of a product candidate vary substantially according to the type, complexity, novelty and intended use and market of such product candidates. The regulatory approval process for novel product candidates such as ours can be more expensive and take longer than for other, better known or more extensively studied product candidates. To date, only a limited number of gene therapies have received marketing authorization from the FDA or foreign regulatory authorities. Until August 2017, the FDA had never approved a gene therapy product. Since that time, it has only approved a small number of product candidates, including Kymriah by Novartis International AG, for pediatric and young adult patients with a form of acute lymphoblastic leukemia, Yescarta by Kite Pharma, Inc., for adult patients with certain forms of non-Hodgkin lymphoma, and Luxturna by Spark Therapeutics, Inc., or Spark, for patients with an inherited form of vision loss. It is difficult to determine how long it will take or how much it will cost to obtain regulatory approvals for our product candidates in either the United States, or other major markets or how long it will take to commercialize our product candidates, if any are approved. Approvals by foreign regulatory authorities may not be indicative of what the FDA may require for approval, and vice versa.

Regulatory requirements governing gene and cell therapy products have changed frequently and may continue to change in the future. The FDA has established the Office of Tissues and Advanced Therapies within its Center for Biologics Evaluation and Research, or CBER, to consolidate the review of gene therapy and related products, and has established the Cellular, Tissue and Gene Therapies Advisory Committee to advise the CBER in its review. Gene therapy clinical trials conducted at institutions that receive funding for recombinant DNA research from the NIH, also are potentially subject to review by the NIH Office of Science Policy's Recombinant DNA Advisory Committee, or the RAC, in limited circumstances. Although the FDA decides whether individual gene therapy protocols may proceed, the RAC public review process, if undertaken, can delay the initiation of a clinical trial, even if the FDA has reviewed the trial design and details and authorized its initiation. Conversely, the FDA can put an investigational new drug application, or IND, on clinical hold even if the RAC has provided a favorable review or an exemption from in-depth, public review. If we were to engage an NIH-funded institution, to conduct a clinical trial, that institution's institutional biosafety committee, or IBC, as well as its institutional review board, or IRB, would need to review the proposed clinical trial to assess the safety of the trial and may determine that RAC review is needed. In addition, adverse developments in clinical trials of gene therapy products conducted by others may cause the FDA or other oversight bodies to change the requirements for approval of any of our product candidates. Similarly, foreign regulatory authorities may issue new guidelines concerning the development and marketing authorization for gene therapy medicinal products and require that we comply with these new guidelines.

The FDA, NIH and the European Medicines Agency, or EMA, have each expressed interest in further regulating biotechnology, including gene therapy and genetic testing. For example, the EMA advocates a risk-based approach to the development of a gene therapy product. Agencies at both the federal and state level in the United States, as well as

the U.S. Congressional committees and other governments or governing agencies, have also expressed interest in further regulating the biotechnology industry. Such action may delay or prevent commercialization of some or all of our product candidates.

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These regulatory review committees and advisory groups and any new guidelines they promulgate may lengthen the regulatory review process, require us to perform additional studies, increase our development costs, lead to changes in regulatory positions and interpretations, delay or prevent approval and commercialization of these product candidates or lead to significant post-approval limitations or restrictions. As we advance our product candidates, we will be required to consult with these regulatory and advisory groups, and comply with applicable guidelines. If we fail to do so, we may be required to delay or discontinue development of certain of our product candidates. These additional processes may result in a review and approval process that is longer than we otherwise would have expected. Delay or failure to obtain, or unexpected costs in obtaining, the regulatory approval necessary to bring a potential product to market could decrease our ability to generate sufficient product revenue, and our business, financial condition, results of operations and prospects would be materially and adversely affected.

The FDA recently announced that it is preparing to release a series of draft guidance regarding potential accelerated approval endpoints for certain gene therapy products and other clinical and manufacturing issues related to gene therapy products. We cannot be certain when such guidance will be issued or whether any such guidance will address accelerated approval endpoints or other clinical or manufacturing issues that will be relevant to or have an impact on our gene therapy candidates or the duration or expense of any applicable regulatory review processes.

Even if we obtain FDA approval for our product candidates in the United States, we may never obtain approval for or commercialize them in any other jurisdiction, which would limit our ability to realize their full market potential.

In order to market any products in any particular jurisdiction, we must establish and comply with numerous and varying regulatory requirements on a country-by-country basis regarding safety and efficacy. Approval by the FDA in the United States does not ensure approval by regulatory authorities in other countries or jurisdictions. In addition, clinical trials conducted in one country may not be accepted by regulatory authorities in other countries, and regulatory approval in one country does not guarantee regulatory approval in any other country. Approval processes vary among countries and can involve additional product testing and validation and additional administrative review periods. Seeking foreign regulatory approval could result in difficulties and costs for us and require additional nonclinical studies or clinical trials which could be costly and time consuming. Regulatory requirements can vary widely from country to country and could delay or prevent the introduction of our products in those countries. We do not have any product candidates approved for sale in any jurisdiction, including in international markets, and we do not have experience in obtaining regulatory approval in international markets. If we fail to comply with regulatory requirements in international markets or to obtain and maintain required approvals, or if regulatory approvals in international markets are delayed, our target market will be reduced and our ability to realize the full market potential of any product we develop will be unrealized.

Even if we obtain regulatory approval for our product candidates, we will still face extensive regulatory requirements and our products may face future development and regulatory difficulties.

Any product candidate for which we obtain marketing approval, along with the manufacturing processes, post-approval clinical data, labeling, packaging, distribution, adverse event reporting, storage, recordkeeping, export, import, advertising and promotional activities for such product, among other things, will be subject to extensive and ongoing requirements of and review by the FDA, the EMA, the PMDA and other comparable foreign regulatory authorities. These requirements include submissions of safety and other post-marketing information and reports, establishment registration and drug listing requirements, continued compliance with current good manufacturing practices, or cGMP, requirements relating to manufacturing, quality control, quality assurance and corresponding maintenance of records and documents, requirements regarding the distribution of samples to physicians and recordkeeping and current GCP requirements for any clinical trials that we conduct post-approval. Even if marketing approval of a product candidate is granted, the approval may be subject to limitations on the indicated uses for which the product may be marketed or to the conditions of approval, including any requirement to implement a REMS. If any of our product candidates receives marketing approval, the accompanying labels for such products may limit the approved use of the drug, which could limit sales.

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Regulatory authorities may also impose requirements for costly post-marketing studies or clinical trials and surveillance to monitor the safety or efficacy of the product. For example, the holder of an approved NDA or BLA is obligated to monitor and report adverse events and any failure of a product to meet the specifications in the NDA or BLA. The FDA typically advises that patients treated with gene therapy undergo follow-up observations for potential adverse events for a 15-year period. The holder of an approved NDA or BLA also must submit new or supplemental applications and obtain FDA approval for certain changes to the approved product, product labeling or manufacturing process. These authorities closely regulate 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. We will be subject to stringent restrictions on manufacturers' communications regarding off-label use and if we do not market our products for their approved indications, we may be subject to enforcement action for off-label marketing. Violations of the DCA or PHSA in the United States, and other comparable regulations in foreign jurisdictions, relating to the promotion of prescription drugs may lead to enforcement actions and investigations alleging violations of U.S. federal and state health care fraud and abuse laws, as well as state consumer protection laws and comparable laws in foreign jurisdictions.

In addition, later discovery of previously unknown adverse events or other problems with our products, manufacturers or manufacturing processes, or failure to comply with regulatory requirements, may yield various results, including:

- restrictions on manufacturing such products;
- restrictions on the labeling or marketing of such products;
- restrictions on product marketing, distribution or use;
- requirements to conduct post-marketing studies or clinical trials;
- warning or untitled letters;
- withdrawal of the products from the market;
- recall of products;
- fines, restitution or disgorgement of profits or revenues;
- suspension or withdrawal of marketing approvals;
- refusal to permit the import or export of such products;
- product seizure; or
- injunctions or the imposition of civil or criminal penalties.

Government regulations may change and additional government regulations may be enacted, either of which could prevent, limit or delay regulatory approval of our product candidates or any future product candidate. If we are slow or unable to adapt to changes in existing requirements or the adoption of new requirements or policies, or if we are not able to maintain regulatory compliance, we may lose any marketing approval that we may have obtained.

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

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

- the efficacy and potential advantages compared to alternative treatments;
- the effectiveness of sales and marketing efforts;
- the cost of treatment in relation to alternative treatments, including any similar generic treatments;
- our ability to offer our products for sale at competitive prices;
- the convenience and ease of administration compared to alternative treatments;

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- the willingness of the target patient population to try new therapies and of physicians to prescribe these therapies;
- the ethical, social and legal concerns about gene therapy;
- the strength of marketing and distribution support;
- the availability of third-party coverage and adequate reimbursement;
- the prevalence and severity of any side effects; and
- any restrictions on the use of our product together with other medications.

We expect sales of our product candidates, if approved, to generate substantially all of our product revenues for the foreseeable future. The failure of any of our product candidates, if approved, to find market acceptance would harm our business and could require us to seek additional financing.

Our gene therapy approach for our lead product candidate, AXO-Lenti-PD, utilizes lentiviral vectors derived from plasmids that encode viral proteins, which may be perceived as unsafe or may result in unforeseen adverse events. Negative public opinion and increased regulatory scrutiny of gene therapy and genetic research may damage public perception of our product candidates or adversely affect our ability to conduct our business or obtain regulatory approvals for our product candidates.

Gene therapy remains a novel technology, with only a limited number of gene therapy products approved to date. Public perception may be influenced by claims that gene therapy is unsafe, unethical or immoral, and gene therapy may not gain the acceptance of the public or the medical community. In particular, our success will depend upon the comfort level of physicians to prescribe our product candidates, including AXO-Lenti-PD (if approved), in lieu of, or in addition to, existing or standard treatments they are already familiar with and for which greater clinical data may be available. More restrictive government regulations or negative public opinion would have a negative effect on our business or financial condition and may delay or impair the development and commercialization of AXO-Lenti-PD. For example, earlier gene therapy trials led to several well-publicized adverse events, including cases of leukemia and death seen in such trials using earlier generation vectors. In addition, there is the potential risk of delayed adverse events following exposure to gene therapy products due to persistent biological activity of the genetic material or other components of products used to carry the genetic material. Adverse events in our clinical studies, even if not ultimately attributable to our product candidates (such as the many adverse events that typically arise from the conditioning process), or adverse events in other lentiviral gene therapy trials, and the resulting publicity, could result in increased governmental regulation, unfavorable public perception, potential regulatory delays in the testing or approval of our potential product candidates, stricter labeling requirements for those product candidates that are approved and a decrease in demand for any such product candidates.

If we are unable to establish sales, marketing and distribution capabilities either on our own or in collaboration with third parties, we may not be successful in commercializing our product candidates, even if approved.

We do not have a full infrastructure for the sales, marketing or distribution of our product candidates should they be approved, and the cost of establishing and maintaining such an organization may exceed the cost-effectiveness of doing so. In order to market any product that may be approved, we must build our sales, distribution, marketing, managerial and other non-technical capabilities or make arrangements with third parties to perform these services, and obtain requisite licenses. To achieve commercial success for any product for which we have obtained marketing approval, we will need a sales and marketing organization.

We plan to commercialize our product candidates in the United States, the European Union, Japan and other major markets. If our product candidates are approved for marketing, we may build a focused sales, distribution and marketing infrastructure to market them. There are significant expenses and risks involved with establishing our own sales, marketing and distribution capabilities, including our ability to hire, retain and appropriately incentivize qualified individuals, generate sufficient sales leads, provide adequate training to sales and marketing personnel, and effectively manage a geographically dispersed sales and marketing team. Any failure or delay in the development of our internal sales, marketing and distribution capabilities, and any failure to obtain and maintain the requisite licenses, could delay any product launch, which would adversely impact the commercialization of our product candidates. Factors that may inhibit our efforts to commercialize our products on our own include:

- our inability to recruit, train and retain adequate numbers of effective sales and marketing personnel;

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- the inability of sales personnel to obtain access to physicians or attain adequate numbers of physicians to prescribe any drugs; and
- unforeseen costs and expenses associated with creating an independent sales and marketing organization.

If we are unable to build our own sales force or negotiate a collaborative relationship for the commercialization of our product candidates we may be forced to delay the potential commercialization of such products or reduce the scope of our sales or marketing activities for our product candidates. If we elect to increase our expenditures to fund commercialization activities ourselves, we will need to obtain additional capital, which may not be available to us on acceptable terms, or at all. If we do not have sufficient funds, we will not be able to bring our product candidates to market or generate product revenue. We could enter into arrangements with collaborative partners or otherwise at an earlier stage than otherwise would be ideal and we may be required to relinquish rights to one or more of our product candidates or otherwise agree to terms unfavorable to us, any of which may have an adverse effect on our business, operating results and prospects.

If we obtain approval to commercialize any products outside of the United States, a variety of risks associated with international operations could materially adversely affect our business.

If our product candidates are approved for commercialization, we may enter into agreements with third parties to market them in certain jurisdictions outside the United States. We expect that we will be subject to additional risks related to international operations or entering into international business relationships, including:

- different regulatory requirements for drug approvals and rules governing drug commercialization in foreign countries;
- reduced protection for intellectual property rights;
- unexpected changes in tariffs, trade barriers and regulatory requirements;
- economic weakness, including inflation, or political instability in particular foreign economies and markets;
- compliance with tax, employment, immigration and labor laws for employees living or traveling abroad;
- foreign reimbursement, pricing and insurance regimes;
- foreign taxes;
- foreign currency fluctuations, which could result in increased operating expenses and reduced revenues, and other obligations incident to doing business in another country;
- workforce uncertainty in countries where labor unrest is more common than in the United States;
- potential noncompliance with the U.S. Foreign Corrupt Practices Act, the U.K. Bribery Act 2010 and similar anti-bribery and anticorruption laws in other jurisdictions;
- production shortages resulting from any events affecting raw material supply or manufacturing capabilities abroad; and
- business interruptions resulting from geopolitical actions, including war and terrorism, or natural disasters including earthquakes, typhoons, floods and fires.

Our current and future relationships with investigators, health care professionals, consultants, third-party payors, and customers will be subject to applicable healthcare regulatory laws, which could expose us to penalties.

Our business operations and current and future arrangements with investigators, healthcare professionals, consultants, third-party payors and customers, may expose us to broadly applicable fraud and abuse and other healthcare laws and regulations. These laws may regulate the business or financial arrangements and relationships through which we conduct our operations, including how we research, market, sell and distribute our products for which we obtain marketing approval. Such laws include:

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- the federal Anti-Kickback Statute prohibits, among other things, persons and entities from knowingly and willfully soliciting, offering, receiving or providing remuneration, directly or indirectly, in cash or in kind, to induce or reward, or in return for, either the referral of an individual for, or the purchase, lease, order or recommendation of, any good, facility, item or service, for which payment may be made, in whole or in part, under a federal healthcare program such as Medicare and Medicaid. A person or entity does not need to have actual knowledge of the federal Anti-Kickback Statute or specific intent to violate it to have committed a violation; in addition, 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;
- the federal false claims laws, including the civil False Claims Act, impose criminal and civil penalties, including through civil whistleblower or qui tam actions, against individuals or entities for knowingly presenting, or causing to be presented, to the federal government, claims for payment that are false or fraudulent, knowingly making, using or causing to be made or used, a false record or statement material to a false or fraudulent claim, or knowingly making, or causing to be made, a false statement to avoid, decrease or conceal an obligation to pay money to the federal government;
- the federal Health Insurance Portability and Accountability Act of 1996, or HIPAA, imposes criminal and civil liability for, among other things, knowingly and willfully executing, or attempting to execute, a scheme to defraud any healthcare benefit program or making false or fraudulent statements relating to healthcare matters. Similar to the federal Anti-Kickback Statute, a person or entity does not need to have actual knowledge of the statute or specific intent to violate it to have committed a violation;
- HIPAA, as amended by the Health Information Technology for Economic and Clinical Health Act and its implementing regulations, also imposes obligations, including mandatory contractual terms, with respect to safeguarding the privacy, security and transmission of individually identifiable health information on health plans, health care clearing houses, and most providers and their business associates, defined as independent contractors or agents of covered entities that create, receive or obtain protected health information in connection with providing a service for or on behalf of a covered entity;
- a number of federal, state and foreign laws, regulations, guidance and standards that impose requirements regarding the protection of health or other personal data that are applicable to or affect our operations;
- the federal Physician Payments Sunshine Act, which requires certain manufacturers of drugs, devices, biologics and medical supplies for which payment is available under Medicare, Medicaid or the Children's Health Insurance Program (with certain exceptions) to report annually to the government information related to payments or other "transfers of value" made to physicians (defined to include doctors, dentists, optometrists, podiatrists and chiropractors) and teaching hospitals, and requires applicable manufacturers and group purchasing organizations to report annually to the government ownership and investment interests held by the physicians described above and their immediate family members and payments or other "transfers of value" to such physician owners (covered manufacturers are required to submit reports to the government by the 90th day of each calendar year); and
- analogous state and foreign laws and regulations, such as state anti-kickback and false claims laws, may apply to our business practices, including but not limited to, research, distribution, sales, and marketing arrangements and claims involving healthcare items or services reimbursed by non-governmental third-party payors, including private insurers, or otherwise restrict payments that may be made to healthcare providers and other potential referral sources; and state laws that require pharmaceutical companies to comply with the pharmaceutical industry's voluntary compliance guidelines and the relevant compliance guidance promulgated by the federal government; state laws that require drug manufacturers to report information related to payments and other transfers of value to physicians and other healthcare providers or marketing expenditures, as well as state and local laws that require the registration of pharmaceutical sales representatives; and state and foreign laws governing the privacy and security of health information in some circumstances, many of which differ from each other in significant ways and often are not preempted by HIPAA, thus complicating compliance efforts.

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Efforts to ensure that our current and future business arrangements with third parties will comply with applicable healthcare laws and regulations will involve substantial costs. It is possible that governmental authorities will conclude that our business practices do not comply with current or future statutes, regulations, agency guidance or case law involving applicable healthcare laws. If our operations are found to be in violation of any of these or any other health regulatory laws that may apply to us, we may be subject to significant penalties, including the imposition of significant civil, criminal and administrative penalties, damages, monetary fines, disgorgement, individual imprisonment, possible exclusion from participation in Medicare, Medicaid and other federal healthcare programs, contractual damages, reputational harm, diminished profits and future earnings, additional reporting requirements and oversight if we become subject to a corporate integrity agreement or similar agreement, and curtailment or restructuring of our operations, any of which could adversely affect our ability to operate our business and our results of operations. Even the mere issuance of a subpoena or the fact of an investigation alone, regardless of the merit, may result in negative publicity, a drop in our share price, and other harm to our business, financial condition and results of operations.

Defending against any such actions can be costly, time-consuming and may require significant financial and personnel resources. Therefore, even if we are successful in defending against any such actions that may be brought against us, our business may be impaired.

Recently enacted and future legislation may increase the difficulty and cost for us to obtain marketing approval of and commercialize our product candidates and affect the prices we may obtain.

In the United States and some foreign jurisdictions, there have been a number of legislative and regulatory changes and proposed changes regarding the healthcare system that could, among other things, prevent or delay marketing approval of our product candidates, restrict or regulate post-approval activities and affect our ability to profitably sell any products for which we obtain marketing approval.

For example, in March 2010, the Patient Protection and Affordable Care Act, as amended by the Health Care and Education Reconciliation Act, collectively the Affordable Care Act, was enacted to broaden access to health insurance, reduce or constrain the growth of healthcare spending, enhance remedies against fraud and abuse, add new transparency requirements for health care and health insurance industries, impose new taxes and fees on the health industry and impose additional health policy reforms. The law has continued the downward pressure on pharmaceutical pricing, especially under the Medicare program, and increased the industry's regulatory burdens and operating costs. Among the provisions of the Affordable Care Act of importance to our potential drug candidates are the following:

- an annual, nondeductible fee payable by any entity that manufactures or imports specified branded prescription drugs and biologic agents;
- an increase in the statutory minimum rebates a manufacturer must pay under the Medicaid Drug Rebate Program;
- a new methodology by which rebates owed by manufacturers under the Medicaid Drug Rebate Program are calculated for drugs that are inhaled, infused, instilled, implanted or injected;
- a new Medicare Part D coverage gap discount program, in which manufacturers must agree to offer 50% (and 70% commencing January 1, 2019) point-of-sale discounts off negotiated prices of applicable brand drugs to eligible beneficiaries under their coverage gap period, as a condition for the manufacturer's outpatient drugs to be covered under Medicare Part D;
- extension of manufacturers' Medicaid rebate liability to individuals enrolled in Medicaid managed care organizations;
- expansion of eligibility criteria for Medicaid programs in certain states;
- expansion of the entities eligible for discounts under the Public Health Service pharmaceutical pricing program;
- a new requirement to annually report drug samples that manufacturers and distributors provide to physicians; and
- a new Patient-Centered Outcomes Research Institute to oversee, identify priorities in, and conduct comparative clinical effectiveness research, along with funding for such research.

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We cannot predict the full impact of the Affordable Care Act on pharmaceutical companies, as many of the reforms require the promulgation of detailed regulations implementing the statutory provisions, some of which has not yet fully occurred. For example, in January 2016, the Centers for Medicare and Medicaid Services issued a final rule regarding the Medicaid Drug Rebate Program, effective April 1, 2016, that, among other things, revises the manner in which the "average manufacturer price" is to be calculated by manufacturers participating in the program and implements certain amendments to the Medicaid rebate statute created under the Affordable Care Act. Further, there have been judicial and Congressional challenges to certain aspects of the Affordable Care Act, and we expect there will be additional challenges and amendments to the Affordable Care Act in the future. Since January 2017, the President of the United States has signed two Executive Orders and other directives designed to delay the implementation of any certain provisions of the Affordable Care Act or otherwise circumvent some of the requirements for health insurance mandated by the Affordable Care Act. The Tax Cuts and Jobs Act of 2017 includes a provision repealing, effective January 1, 2019, the tax-based shared responsibility payment imposed by the Affordable Care Act on certain individuals who fail to maintain qualifying health coverage for all or part of a year that is commonly referred to as the "individual mandate." Congress will likely consider other legislation to replace elements of the Affordable Care Act. The Affordable Care Act is likely to continue the downward pressure on pharmaceutical pricing and may also increase our regulatory burdens and operating costs. We continue to evaluate the effect that the Affordable Care Act and its possible repeal and replacement has on our business. See "Item 1. Business-Government Regulation."

Other legislative changes have been proposed and adopted since the Affordable Care Act was enacted. For example, in August 2011, President Obama signed into law the Budget Control Act of 2011, which, among other things, created the Joint Select Committee on Deficit Reduction to recommend to Congress proposals in spending reductions. The Joint Select Committee did not achieve a targeted deficit reduction of at least $1.2 trillion for the years 2013 through 2021, triggering the legislation's automatic reduction to several government programs. This included further reductions to Medicare payments to providers of 2% per fiscal year, which went into effect in April 2013 and, due to subsequent legislative amendments to the statute, will stay in effect through 2025 unless additional Congressional action is taken. Additionally, in January 2013, the American Taxpayer Relief Act of 2012 was signed into law, which, among other things, reduced Medicare payments to several providers and increased the statute of limitations period in which the government may recover overpayments to providers from three to five years.

Further, there have been several recent U.S. Congressional inquiries and proposed federal and state legislation designed to, among other things, bring more transparency to drug pricing, review the relationship between pricing and manufacturer patient programs, reduce the out-of-pocket cost of prescription drugs and reform government program reimbursement methodologies for drugs. Such scrutiny has resulted in several recent Congressional inquiries and proposed and enacted federal and state legislation designed to, among other things, bring more transparency to pharmaceutical product pricing, review the relationship between pricing and manufacturer patient programs, and reform government program reimbursement methodologies for products. At the federal level, the current administration's budget proposal for fiscal year 2019 contains further drug price control measures that could be enacted during the 2019 budget process or in other future legislation, including, for example, measures to permit Medicare Part D plans to negotiate the price of certain drugs under Medicare Part B, to allow some states to negotiate drug prices under Medicaid, and to eliminate cost sharing for generic drugs for low-income patients. Additionally, on May 11, 2018, the President of the United States laid out his administration's "Blueprint to Lower Drug Prices and Reduce Out-of-Pocket Costs" to reduce the cost of prescription drugs while preserving innovation and cures. The Department of Health and Human Services, or HHS, has already started the process of soliciting feedback on some of these measures and, at the same time, is immediately implementing others under its existing authority. Although some of these and other proposals will require authorization through additional legislation to become effective, Congress and the U.S. presidential administration have each indicated that they will continue to seek new legislative and/or administrative measures to control drug costs. At the state level, legislatures have become increasingly aggressive in passing legislation and implementing regulations designed to control pharmaceutical and biological product pricing, including price or patient reimbursement constraints, discounts, restrictions on certain product access and marketing cost disclosure and transparency measures, and, in some cases, designed to encourage importation from other

countries and bulk purchasing.

Moreover, the Drug Supply Chain Security Act, which was enacted in 2012 as part of the Food and Drug Administration Safety and Innovation Act, imposes new obligations on manufacturers of pharmaceutical products related to product tracking and tracing. Legislative and regulatory proposals have been made to expand post-approval requirements and restrict sales and promotional activities for pharmaceutical products. We are not sure whether additional legislative changes will be enacted, whether the current regulations, guidance or interpretations will be changed, or what the impact of such changes on our business, if any, may be. In addition, increased scrutiny by the U.S. Congress of the FDA's approval process may significantly delay or prevent marketing approval, as well as subject us to more stringent product labeling and post-marketing testing and other requirements.

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

Coverage and adequate reimbursement may not be available for our product candidates, which could make it difficult for us to sell our products profitably, if approved.

Market acceptance and sales of any approved product candidates that we develop will depend in part on the extent to which coverage and adequate reimbursement for these products and related treatments will be available from third-party payors, including government health administration authorities and private health insurers. In the United States, no uniform policy of coverage and reimbursement for products exists among third-party payors. Third-party payors decide which drugs or therapies they will pay for and establish reimbursement levels. One payor's determination to provide coverage for a product does not assure that other payors will also provide coverage, and adequate reimbursement, for the product. Additionally, a third-party payor's decision to provide coverage for a drug or therapy does not imply that an adequate reimbursement rate will be approved. Each plan determines whether or not it will provide coverage for a drug or therapy, what amount it will pay the manufacturer for the drug or therapy, on what tier of its formulary the drug or therapy will be placed, and whether to require step therapy. The position of a drug on a formulary generally determines the co-payment that a patient will need to make to obtain the drug and can strongly influence the adoption of a drug by patients and physicians. Patients who are prescribed treatments for their conditions and providers prescribing such services generally rely on third-party payors to reimburse all or part of the associated healthcare costs. Patients are unlikely to use our products unless coverage is provided and reimbursement is adequate to cover a significant portion of the cost of our products.

The process for determining whether a third-party payor will provide coverage for a product may be separate from the process for setting the price of a product or for establishing the reimbursement rate that such a payor will pay for the product. Even if we do obtain adequate levels of reimbursement, third-party payors, such as government or private healthcare insurers, carefully review and increasingly question the coverage of, and challenge the prices charged for, products. A primary trend in the U.S. healthcare industry and elsewhere is cost containment. Increasingly, third-party payors are requiring that pharmaceutical companies provide them with predetermined discounts from list prices and are challenging the prices charged for products. We may also be required to conduct expensive pharmacoeconomic studies to justify the coverage and the amount of reimbursement for particular medications. We cannot be sure that coverage and reimbursement will be available for any product that we commercialize and, if reimbursement is available, what the level of reimbursement will be. Inadequate coverage or reimbursement may impact the demand for, or the price of, any product for which we obtain marketing approval. If coverage and adequate reimbursement are not available, or are available only to limited levels, we may not be able to successfully commercialize any product candidates that we develop.

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Risks Related to Our Dependence on Third Parties

We do not have our own manufacturing capabilities and will rely on third parties to produce clinical and commercial supplies of our product candidates.

We are building teams with drug formulation and manufacturing expertise but do not own or operate, nor do we expect to own or operate, facilities for product manufacturing, storage and distribution, or testing. In addition to the technical challenges of drug product formulation and scale-up and environmental compliance aspects of chemical and biologics manufacturing, our vendors of manufacturing services will need to comply with U.S. and foreign regulatory authority licensure and GMP quality requirements. These obligations are enforced by periodic inspection and audit by regulatory authorities, and any adverse findings or violations discovered on such inspections could distract our vendors and be costly and time consuming to remediate, potentially impacting their supply of clinical and future commercial products to us.

Under the Oxford BioMedica Agreement, Oxford BioMedica will manufacture and supply the AXO-Lenti-PD in accordance with separate clinical and commercial supply agreements, which will be negotiated between us and Oxford BioMedica. The Oxford BioMedica Agreement contains certain key provisions of the clinical and commercial supply agreements, including pricing structure and our ability to transfer the technology to another manufacturer at any time following the completion of formal process characterization, process validation or BLA submission. Further, the process for manufacturing gene therapy products such as AXO-Lenti-PD is more complex than those required for most chemical pharmaceuticals. Moreover, unlike chemical pharmaceuticals, the physical and chemical properties of a gene therapy product such as ours generally cannot be fully characterized. Although we may establish our own manufacturing facility or use that of a third party contract manufacturer to support a commercial launch of AXO-Lenti-PD, if approved, the timeframe for us to obtain approval for such facility or qualify such third party contract manufacturer and ensure that all processes, methods and equipment are compliant with GMP requirements is uncertain. As a result, we will heavily depend on Oxford BioMedica and its key personnel to manufacture sufficient quantities of AXO-Lenti-PD drug product for future clinical trials as well as in commercial quantities if such product candidate receives regulatory approval.

Under the Arena Development Agreement, subject to specified exceptions, Arena remains the sole and exclusive commercial manufacturer of nelotanserin, and we will depend on Arena to manufacture sufficient quantities of nelotanserin if nelotanserin is approved for commercial sale. Subject to Arena's approval, we have the right to contract with third parties for the manufacture of nelotanserin for development purposes only. Arena has sold their manufacturing facility and will be reliant on third parties to supply finished drug product for commercial sale. We and Arena are reliant on third-party suppliers for the active pharmaceutical ingredient in nelotanserin, and we and Arena have an agreement in place for the supply of active pharmaceutical ingredient. If we are unable to maintain a relationship with this or other third-party contractors, or if Arena is unable to manufacture or otherwise supply nelotanserin finished product to us, whether as a result of its own inability to obtain active pharmaceutical ingredient or finished drug product or otherwise, we could experience delays in our development and commercial efforts. In January 2018, we were notified by Arena that it has assigned all of its rights and obligations under the Arena Development Agreement to an affiliate, 125 Royalty Inc.

Further, our reliance on third-party manufacturers entails risks to which we would not be subject if we manufactured product candidates ourselves, including:

- failure to satisfy their contractual duties or obligations;
- inability to meet our product specifications and quality requirements consistently;
- delay or inability to procure or expand sufficient manufacturing capacity;
- manufacturing and/or product quality issues related to manufacturing development and scale-up;
- costs and validation of new equipment and facilities required for scale-up;
- failure to comply with applicable laws, regulations, and standards, including cGMP and similar foreign standards;
- deficient or improper record-keeping;
- contractual restrictions on our ability to engage additional or alternative manufacturers;
- inability to negotiate manufacturing agreements with third parties under commercially reasonable terms;
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termination or nonrenewal of manufacturing agreements with third parties in a manner or at a time that is costly or damaging to us;

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- reliance on a limited number of sources, and in some cases, single sources for product components, such that if we are unable to secure a sufficient supply of these product components, we will be unable to manufacture and sell our product candidates or any future product candidate in a timely fashion, in sufficient quantities or under acceptable terms;
- lack of qualified backup suppliers for those components that are currently purchased from a sole or single source supplier;
- lack of access or licenses to proprietary manufacturing methods used by third-party manufacturers to make our product candidates;
- operations of our third-party manufacturers or suppliers could be disrupted by conditions unrelated to our business or operations, including the bankruptcy of the manufacturer or supplier or regulatory sanctions related to the manufacture of our or other company's products;
- carrier disruptions or increased costs that are beyond our control; and
- failure to deliver our products under specified storage conditions and in a timely manner.

Our product candidate AXO-Lenti-PD is manufactured using technically complex processes requiring specialized facilities, highly specific raw materials and other production constraints. The complexity of these processes, as well as strict government standards for the manufacture and storage of our product candidates, subjects us to manufacturing risks for this product candidate. If supply from a manufacturing facility is interrupted, there could be a significant disruption in supply of our product candidates. Further, under the terms of our supply and manufacturing agreements, including those we will enter into with Oxford BioMedica, we may be limited in entering into arrangements with third parties for the manufacture and supply of AXO-Lenti-PD. Even if we were able to engage other manufacturers or suppliers, we may not be able to enter into arrangements with on favorable terms or at all. Use of new third-party manufacturers could increase the risk of delays in production or insufficient supplies of our product candidates as we transfer our manufacturing technology to these manufacturers and as they gain experience manufacturing our product candidates.

Any of these events affecting our product candidates or those of adjuncts could lead to clinical trial delays, cost overruns, delay or failure to obtain regulatory approval or impact our ability to successfully commercialize our products, as well as potential product liability litigation, product recalls or product withdrawals. Some of these events could be the basis for FDA action, including injunction, recall, seizure, or total or partial suspension of production.

We intend to rely on third parties to conduct, supervise and monitor our nonclinical studies and our clinical trials, and if those third parties perform in an unsatisfactory manner, it may harm our business.

We intend to rely on CROs and nonclinical and clinical trial sites to ensure the proper and timely conduct of our nonclinical studies and our clinical trials, and we expect to have limited influence over their actual performance. In addition, pursuant to the Oxford BioMedica Agreement, we may rely on Oxford BioMedica employees for certain services in connection with the transition of AXO-Lenti-PD. We will not have complete control over those employees or their execution of services provided to us under the Oxford BioMedica Agreement.

We intend to rely upon CROs to monitor and manage data for our clinical programs, as well as the execution of future nonclinical studies. We expect to control only certain aspects of our CROs' activities. Nevertheless, we will be responsible for ensuring that each of our studies is conducted in accordance with the applicable protocol, legal, regulatory and scientific standards and our reliance on the CROs does not relieve us of our regulatory responsibilities. We and our CROs will be required to comply with Good laboratory practices or GLPs and GCPs, which are regulations and guidelines enforced by the FDA and are also required by the competent authorities of the member states of the European Economic Area and comparable foreign regulatory authorities in the form of International Council for Harmonization guidelines for any of our product candidates that are in nonclinical and clinical development. The regulatory authorities enforce GCPs through periodic inspections of trial sponsors, principal investigators and clinical trial sites. If we or our CROs fail to comply with GCPs, the clinical data generated in our clinical trials may be deemed unreliable and the FDA or comparable foreign regulatory authorities may reject our marketing applications or require us to perform additional clinical trials before approving our marketing applications. Accordingly, if we or our CROs fail to comply with these regulations or other applicable laws, regulations or standards, or fail to recruit a sufficient number of subjects, we may be required to repeat clinical trials,

which would delay the relevant regulatory approval process. Failure by our CROs to properly execute study protocols in accordance with applicable law could also create product liability and healthcare regulatory risks for us as sponsors of those studies.

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Our CROs will not be our employees, and we will not control whether or not they devote sufficient time and resources to our clinical and nonclinical programs. These CROs may also have relationships with other commercial entities, including our competitors, for whom they may also be conducting clinical trials, or other drug development activities which could harm our competitive position. We face the risk of potential unauthorized disclosure or misappropriation of our intellectual property by CROs, which may reduce our trade secret and intellectual property protection and allow our potential competitors to access and exploit our proprietary technology. If our CROs do not successfully carry out their contractual duties or obligations, fail to meet expected deadlines, or if the quality or accuracy of the clinical data they obtain is compromised due to the failure to adhere to our (or their own) clinical protocols or regulatory requirements or for any other reasons, our clinical trials may be extended, delayed or terminated, and we may not be able to obtain regulatory approval for, or successfully commercialize, any product candidate that we develop. As a result, our financial results and the commercial prospects for any product candidate that we develop could be harmed, our costs could increase, and our ability to generate revenues could be delayed.

If our relationships with these CROs terminate, we may not be able to enter into arrangements with alternative CROs or do so on commercially reasonable terms or in a timely manner. Switching or adding additional CROs involves substantial cost and requires management time and focus. In addition, there is a natural transition period when a new CRO commences work. As a result, delays occur, which can materially impact our ability to meet our desired clinical development timelines. Though we intend to carefully manage our relationships with our CROs, there can be no assurance that we will not encounter challenges or delays in the future or that these delays or challenges will not have an adverse impact on our business, financial condition and prospects.

Certain intellectual property of Oxford BioMedica relating to AXO-Lenti-PD and other gene therapy products that we have licensed from Oxford BioMedica are subject to a lien under Oxford BioMedica's debt agreements. The foreclosure on such intellectual property or exercise of other remedies available to the lenders under such debt agreements could materially adversely affect our rights under the Oxford BioMedica Agreement and our future prospects.

Certain intellectual property and other intangible assets of Oxford BioMedica, excluding the Gene Therapy Product-specific intellectual property licensed under the Oxford BioMedica Agreement, are encumbered by an existing loan agreement between Oxford BioMedica and certain of its lenders. There can be no assurance that Oxford BioMedica will remain in compliance with its obligations under the loan agreement. In the event of foreclosure or exercise of other remedies by the lenders under such agreement on the assets (including such intellectual property) pledged to such lenders, our ability to use and develop AXO-Lenti-PD and other gene therapy product candidates under the license may be materially adversely affected, and we may be required to negotiate with third party lenders with whom we do not have a prior relationship.

We may seek to enter into collaborations in the future with other third parties. If we are unable to enter into such collaborations, or if these collaborations are not successful, our business could be adversely affected.

We will seek to enter into additional collaborations in the future, including sales, marketing, distribution, development, licensing, and/or broader collaboration agreements. Our likely collaborators include large and mid-size pharmaceutical companies, regional and national pharmaceutical companies, biotechnology companies, and medical device manufacturers. However, we may not be able to enter into additional collaborations on favorable terms or at all. Our ability to generate revenues from our collaborations will depend on our and our collaborators' abilities to successfully perform the functions assigned to each of us in these arrangements. In addition, our collaborators have the ability to abandon research or development projects and terminate applicable agreements. Moreover, an unsuccessful outcome in any clinical trial for which our collaborator is responsible could be harmful to the public perception and prospects of our existing product candidate pipeline.

Our relationship with any future collaborations may pose several risks, including the following:

- collaborators have significant discretion in determining the amount and timing of the efforts and resources that they will apply to these collaborations;
- collaborators may not perform their obligations as expected;
- the nonclinical studies and clinical trials conducted as part of these collaborations may not be successful;
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collaborators may not pursue development and commercialization of any product candidates that achieve regulatory approval or may elect not to continue or renew development or commercialization programs based on nonclinical study or clinical trial results, changes in the collaborators' strategic focus or available funding or external factors, such as an acquisition, that divert resources or create competing priorities;

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- collaborators may delay nonclinical studies and clinical trials, provide insufficient funding for nonclinical studies and clinical trials, stop a nonclinical study or clinical trial or abandon a product candidate, repeat or conduct new nonclinical studies or clinical trials or require a new formulation of a product candidate for nonclinical studies or clinical trials;
- we may not have access to, or may be restricted from disclosing, certain information regarding product candidates being developed or commercialized under a collaboration and, consequently, may have limited ability to inform our stockholders about the status of such product candidates;
- collaborators could independently develop, or develop with third parties, products that compete directly or indirectly with our product candidates if the collaborators believe that competitive products are more likely to be successfully developed or can be commercialized under terms that are more economically attractive than ours;
- product candidates developed in collaboration with us may be viewed by our collaborators as competitive with their own product candidates or products, which may cause collaborators to cease to devote resources to the commercialization of our product candidates;
- a collaborator with marketing and distribution rights to one or more of our product candidates that achieve regulatory approval may not commit sufficient resources to the marketing and distribution of any such product candidate;
- disagreements with collaborators, including disagreements over proprietary rights, contract interpretation or the preferred course of development of any product candidates, may cause delays or termination of the research, development or commercialization of such product candidates, may lead to additional responsibilities for us with respect to such product candidates or may result in litigation or arbitration, any of which would be time consuming and expensive;
- collaborators may not properly maintain or defend our intellectual property rights or may use our proprietary information in such a way as to invite litigation that could jeopardize or invalidate our intellectual property or proprietary information or expose us to potential litigation;
- disputes may arise with respect to the ownership or inventorship of intellectual property developed pursuant to our collaborations;
- collaborators may infringe the intellectual property rights of third parties, which may expose us to litigation and potential liability;
- the terms of our collaboration agreement may restrict us from entering into certain relationships with other third parties, thereby limiting our options; and
- collaborations may be terminated for the convenience of the collaborator and, if terminated, we could be required to raise additional capital to pursue further development or commercialization of the applicable product candidates.

We will face significant competition in seeking appropriate collaborators, and the negotiation process is time-consuming and complex. Our ability to reach a definitive collaboration agreement with any future collaborators will depend, among other things, upon our assessment of the collaborator's resources and expertise, the terms and conditions of the proposed collaboration and the proposed collaborator's evaluation of several factors. Those factors may include the design or results of clinical trials, the likelihood of approval by the FDA or similar regulatory authorities outside the United States, the potential market for the subject product candidate, the costs and complexities of manufacturing and delivering such product candidate to patients, the potential of competing products, the existence of uncertainty with respect to our ownership of technology, which can exist if there is a challenge to such ownership without regard to the merits of the challenge, and industry and market conditions generally. We may also be restricted under future license agreements from entering into agreements on certain terms with potential collaborators.

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Risks Related to Our Intellectual Property

If we are unable to obtain and maintain patent protection for our technology and products or if the scope of the patent protection obtained is not sufficiently broad, we may not be able to compete effectively in our markets.

We rely upon a combination of patents, trademarks, copyrights, trade secret protection and confidentiality agreements with employees, consultants, collaborators, advisors and other third parties to protect the intellectual property related to our drug development programs and product candidates. However, our success depends in large part on our ability to obtain and maintain patent protection in the United States and other countries for our product candidates and any future product candidates. We seek to protect our proprietary position by filing patent applications in the United States and abroad related to our development programs and product candidates. The patent prosecution process is expensive and time-consuming, and we may not be able to file and prosecute all necessary or desirable patent applications at a reasonable cost or in a timely manner.

It is also possible that we will fail to identify patentable aspects of our research and development output before it is too late to obtain patent protection. The patent applications that we own or in-license may fail to result in issued patents with claims that cover our current product candidates or any future product candidate in the United States or in other foreign countries. We may also inadvertently make statements to regulatory agencies during the regulatory approval process that may be inconsistent with positions that have been taken during prosecution of our patents which may result in such patents being narrowed, invalidated, or held unenforceable.

The patent rights that we own or have licensed relating to our product candidates may be limited in ways that may affect our ability to exclude third parties from competing against us if we obtain regulatory approval to market these product candidates. For our product candidates for which we do not hold composition of matter patents, competitors who obtain the requisite regulatory approval can offer products with the same composition as our products so long as the competitors do not infringe any method of use patents that we may hold. For some of our product candidates, the principal patent protection that covers or that we expect will cover, our product candidate is a method of use patent. This type of patent only protects the product when used or sold for the specified method. However, this type of patent does not limit a competitor from making and marketing a product that is identical to our product that is labeled for an indication that is outside of the patented method, or for which there is a substantial use in commerce outside the patented method.

There is no assurance that all of the potentially relevant prior art relating to our patents and patent applications has been found, which can invalidate a patent or prevent a patent from issuing from a pending patent application. Even if patents do successfully issue and even if such patents cover our product candidates, third parties may challenge their validity, enforceability or scope, which may result in such patents being narrowed, invalidated, or held unenforceable. Any successful opposition to these patents or any other patents owned by or licensed to us could deprive us of rights necessary for the successful commercialization of any product candidates that we may develop. Further, if we encounter delays in regulatory approvals, the period of time during which we could market a product candidate under patent protection could be reduced.

If the patent applications we hold or have in-licensed with respect to our development programs and product candidates fail to issue, if their breadth or strength of protection is threatened, or if they fail to provide meaningful exclusivity for our product candidates, it could dissuade companies from collaborating with us to develop product candidates, and threaten our ability to commercialize future drugs. Our pending applications cannot be enforced against third parties practicing the technology claimed in such applications unless and until a patent issues from such applications. Any such outcome could have a materially adverse effect on our business.

The patent position of biotechnology and pharmaceutical companies generally is highly uncertain, involves complex legal and factual questions and has in recent years been the subject of much litigation. In addition, the laws of foreign countries may not protect our rights to the same extent as the laws of the United States. For example, European patent law restricts the patentability of methods of treatment of the human body more than United States law does. Publications of discoveries in scientific literature often lag behind the actual discoveries, and patent applications in the United States and other jurisdictions are typically not published until 18 months after filing, or in some cases not at all. Therefore, we cannot know with certainty whether we were the first to make the inventions claimed in our owned or licensed patents or pending patent applications, or whether we were the first to file for patent protection of

such inventions. As a result, the issuance, scope, validity, enforceability and commercial value of our patent rights are highly uncertain. Our pending and future patent applications may not result in patents being issued which protect our technology or products, in whole or in part, or which effectively prevent others from commercializing competitive technologies and products. Changes in either the patent laws or interpretation of the patent laws in the United States and other countries may diminish the value of our patents or narrow the scope of our patent protection.

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On September 16, 2011, the Leahy-Smith America Invents Act, or the Leahy-Smith Act, was signed into law. The Leahy-Smith Act included a number of significant changes to United States patent law. These include provisions that allow third parties to challenge the validity of issued patents. Accordingly, the Leahy-Smith Act and its implementation has increased the uncertainties and costs surrounding the validity, enforcement and defense of our issued patents, all of which could have an adverse effect on our business and financial condition.

Moreover, we may be subject to a third party pre-issuance submission of prior art to the USPTO, or become involved in opposition, derivation, reexamination, inter partes review, post-grant review or interference proceedings challenging our patent rights or the patent rights of others. An adverse determination in any such submission, proceeding or litigation could reduce the scope of, or invalidate, our patent rights, allow third parties to commercialize our technology or products and compete directly against us, without payment to us, or result in our inability to manufacture or commercialize products without infringing third-party patent rights. In addition, if the breadth or strength of protection provided by our patents and patent applications is threatened, it could dissuade companies from collaborating with us to license, develop or commercialize current or future product candidates.

The issuance of a patent is not conclusive as to its inventorship, scope, validity or enforceability, and our owned and licensed patents may be challenged in the courts or patent offices in the United States and abroad. Such challenges may result in loss of exclusivity or freedom to operate or in patent claims being narrowed, invalidated or held unenforceable, in whole or in part, which could limit our ability to stop others from using or commercializing similar or identical technology and products, or limit the duration of the patent protection of our technology and products. Moreover, patents have a limited lifespan. In the United States, the natural expiration of a patent is generally 20 years after it is filed. Various extensions may be available; however, the life of a patent, and the protection it affords, is limited. Without patent protection for our current or future product candidates, we may be open to competition from generic versions of such products. Given the amount of time required for the development, testing and regulatory review of new product candidates, patents protecting such candidates might expire before or shortly after such candidates are commercialized. As a result, our owned and licensed patent portfolio may not provide us with sufficient rights to exclude others from commercializing products similar or identical to ours.

If we do not obtain protection under the Hatch-Waxman Amendments by extending the patent term for our drug candidates, our business may be materially harmed.

Our commercial success will largely depend on our ability to obtain and maintain patent and other intellectual property in the United States and other countries with respect to our proprietary technology, drug candidates and our target indications. Given the amount of time required for the development, testing and regulatory review of new drug candidates, patents protecting our drug candidates might expire before or shortly after such candidates begin to be commercialized. We expect to seek extensions of patent terms in the United States and, if available, in other countries where we are prosecuting patents.

Depending upon the timing, duration and specifics of FDA marketing approval of our drug candidates, one or more of our U.S. patents may be eligible for limited patent term restoration under the Drug Price Competition and Patent Term Restoration Act of 1984, referred to as the Hatch-Waxman Amendments. The Hatch-Waxman Amendments permit a patent restoration term of up to five years beyond the normal expiration of the patent as compensation for patent term lost during development and the FDA regulatory review process, which is limited to the approved indication (or any additional indications approved during the period of extension). This extension is limited to only one patent that covers the approved product. However, the applicable authorities, including the FDA and the USPTO in the United States, and any equivalent regulatory authority in other countries, may not agree with our assessment of whether such extensions are available, and may refuse to grant extensions to our patents, or may grant more limited extensions than we request. We may not be granted an extension because of, for example, failing to apply within applicable deadlines, failing to apply prior to expiration of relevant patents or otherwise failing to satisfy applicable requirements. Moreover, the applicable time period or the scope of patent protection afforded could be less than we request.

If we are unable to extend the expiration date of our existing patents or obtain new patents with longer expiry dates, our competitors may be able to take advantage of our investment in development and clinical trials by referencing our clinical and nonclinical data to obtain approval of competing products following our patent expiration and launch their product earlier than might otherwise be the case.

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The validity, scope and enforceability of any patents listed in the Orange Book that cover our product candidates can be challenged by third parties.

If one of our product candidates is approved by the FDA, one or more third parties may challenge the current patents, or patents that may issue in the future, within our portfolio, including those covering AXO-Lenti-PD and nelotanserin, which could result in the invalidation of, or render unenforceable, some or all of the relevant patent claims or a finding of non-infringement. For example, if a third party files an Abbreviated New Drug Application, or ANDA, for a generic drug containing AXO-Lenti-PD, and relies in whole or in part on studies conducted by or for us, the third party will be required to certify to the FDA that either: (1) there is no patent information listed in the FDA's Orange Book with respect to our NDA for the applicable approved drug candidate; (2) the patents listed in the Orange Book have expired; (3) the listed patents have not expired, but will expire on a particular date and approval is sought after patent expiration; or (4) the listed patents are invalid or will not be infringed by the manufacture, use or sale of the third party's generic drug. A certification that the new drug will not infringe the Orange Book-listed patents for the applicable approved drug candidate, or that such patents are invalid, is called a paragraph IV certification. If the third party submits a paragraph IV certification to the FDA, a notice of the paragraph IV certification must also be sent to us once the third party's ANDA is accepted for filing by the FDA. We may then initiate a lawsuit to defend the patents identified in the notice. The filing of a patent infringement lawsuit within 45 days of receipt of the notice automatically prevents the FDA from approving the third party's ANDA until the earliest of 30 months or the date on which the patent expires, the lawsuit is settled, or the court reaches a decision in the infringement lawsuit in favor of the third party. If we do not file a patent infringement lawsuit within the required 45-day period, the third party's ANDA will not be subject to the 30-month stay of FDA approval.

If a third party successfully challenges all of the patents that might otherwise be eligible for listing in the Orange Book for one of our products, we will not be entitled to the 30-month stay of FDA approval upon the filing of an ANDA for a generic drug containing, for example, AXO-Lenti-PD, and relies in whole or in part on studies conducted by or for us.

Litigation or other proceedings to enforce or defend intellectual property rights are often very complex in nature, may be very expensive and time-consuming, may divert our management's attention from our core business, and may result in unfavorable results that could limit our ability to prevent third parties from competing with our drug candidates.

The validity, scope and enforceability of any patents that cover our biologic product candidates can be challenged by third parties.

For biologics, such as AXO-Lenti-PD, the Biologics Price Competition and Innovation Act (BPCIA) provides a mechanism for one or more third parties to seek FDA approval to manufacture or sell a biosimilar or interchangeable versions of brand name biological products. Due to the large size and complexity of biological products, as compared to small molecules, a biosimilar must be "highly similar" to the reference product with "no clinically meaningful differences between the two." The BPCIA also provides reference product sponsors with 12 years of market exclusivity, but unlike the Hatch-Waxman Act, it does not require reference product sponsors to list patents in an Orange Book and does not include an automatic 30-month stay of FDA approval upon the timely filing of a lawsuit. The BPCIA, however, does require a formal pre-litigation process which includes the exchange of information between a biosimilar applicant and a reference biologic sponsor that includes the identification of relevant patents and each parties' basis for infringement and invalidity. After the exchange of this information, we may then initiate a lawsuit within 30 days to defend the patents identified in the exchange. If the biosimilar applicant successfully challenges the asserted patent claims it could result in the invalidation of, or render unenforceable, some or all of the relevant patent claims or result in a finding of non-infringement.

Obtaining and maintaining our 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 on any issued patent are due to be paid to the USPTO and other foreign patent agencies in several stages over the lifetime of the patent. The USPTO and various foreign national or international patent agencies require compliance with a number of procedural, documentary, fee payment and other similar provisions during the patent application process. While an inadvertent lapse can in many cases be cured by payment of a late fee or by other

means in accordance with the applicable rules, there are situations in which noncompliance can result in abandonment or lapse of the patent or patent application, resulting in partial or complete loss of patent rights in the relevant jurisdiction. Non-compliance events that could result in abandonment or lapse of patent rights include, but are not limited to, failure to timely file national and regional stage patent applications based on an international patent application, failure to respond to official actions within prescribed time limits, non-payment of fees and failure to properly legalize and submit formal documents. If we or our licensors fail to maintain the patents and patent applications covering our product candidates, our competitors might be able to enter the market, which would have an adverse effect on our business.

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We may need to license intellectual property from third parties, and such licenses may not be available or may not be available on commercially reasonable terms.

A third party may hold intellectual property, including patent rights that are important or necessary to the development of our drug candidates. It may be necessary for us to use the patented or proprietary technology of third parties to commercialize our drug candidates, in which case we would be required to obtain a license from these third parties on commercially reasonable terms, or our business could be harmed, possibly materially.

Third party claims or litigation alleging infringement of patents or other proprietary rights or seeking to invalidate patents or other proprietary rights, may delay or prevent the development and commercialization of our product candidates.

Our commercial success depends in part on our avoiding infringement and other violations of the patents and proprietary rights of third parties. There is a substantial amount of litigation, both within and outside the United States, involving patent and other intellectual property rights in the biotechnology and pharmaceutical industries, including patent infringement lawsuits, interferences, derivation and administrative law proceedings, inter partes review, and post-grant review before the USPTO, as well as oppositions and similar processes in foreign jurisdictions. Numerous U.S. and foreign issued patents and pending patent applications, which are owned by third parties, exist in the fields in which we and our collaborators are developing product candidates. As the biotechnology and pharmaceutical industries expand and more patents are issued, and as we gain greater visibility and market exposure as a public company, the risk increases that our product candidates or other business activities may be subject to claims of infringement of the patent and other proprietary rights of third parties. Third parties may assert that we are infringing their patents or employing their proprietary technology without authorization. We have conducted searches for information in support of patent protection and otherwise evaluated the patent landscape for our product candidates, and, based on these searches and evaluations to date, we do not believe that there are valid patents which contain granted claims that could be asserted with respect to our product. However, we may be incorrect.

There may be third-party patents or patent applications with claims to materials, formulations, methods of manufacture or methods for treatment related to the use or manufacture of our product candidates. Because patent applications can take many years to issue, there may be currently pending patent applications which may later result in issued patents that our product candidates may infringe. In addition, third parties may obtain patents in the future and claim that use of our technologies infringes upon these patents. If any third-party patents were held by a court of competent jurisdiction to cover the manufacturing process of any of our product candidates, any molecules formed during the manufacturing process or any final product itself, the holders of any such patents may be able to block our ability to commercialize such product candidate unless we obtained a license under the applicable patents, or until such patents expire. Similarly, if any third-party patent were held by a court of competent jurisdiction to cover aspects of our formulations, processes for manufacture or methods of use, including combination therapy, the holders of any such patent may be able to block our ability to develop and commercialize the applicable product candidate unless we obtained a license or until such patent expires.

In either case, such a license may not be available on commercially reasonable terms or at all. In addition, we may be subject to claims that we are infringing other intellectual property rights, such as trademarks or copyrights, or misappropriating the trade secrets of others, and to the extent that our employees, consultants or contractors use intellectual property or proprietary information owned by others in their work for us, disputes may arise as to the rights in related or resulting know-how and inventions.

Parties making claims against us may obtain injunctive or other equitable relief, which could effectively block our ability to further develop and commercialize one or more of our product candidates. Defense of these claims, regardless of their merit, would involve substantial litigation expense and would be a substantial diversion of employee resources from our business. In the event of a successful infringement or other intellectual property claim against us, we may have to pay substantial damages, including treble damages and attorneys' fees for willful infringement, obtain one or more licenses from third parties, pay royalties or redesign our affected products, which may be impossible or require substantial time and monetary expenditure. We cannot predict whether any such license would be available at all or whether it would be available on commercially reasonable terms. Furthermore, even in the absence of litigation, we may need to obtain licenses from third parties to advance our research or allow

commercialization of our product candidates, and we have done so from time to time. We may fail to obtain any of these licenses at a reasonable cost or on reasonable terms, if at all. In that event, we would be unable to further develop and commercialize one or more of our product candidates, which could harm our business significantly. Claims that we have misappropriated the confidential information or trade secrets of third parties could have a similar negative impact on our business.

We cannot provide any assurances that third-party patents do not exist which might be enforced against our drugs or product candidates, resulting in either an injunction prohibiting our sales, or, with respect to our sales, an obligation on our part to pay royalties and/or other forms of compensation to third parties.

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We are aware of a third-party patent, as well as third-party patent applications, directed to administering a combination of cholinesterase inhibitor with a peripheral muscarinic receptor antagonist that could adversely affect the potential commercialization of RVT-104. While we do not believe that any such claims that would cover the potential commercialization of RVT-104 are valid or enforceable, we may be incorrect in this belief.

We are also aware of a third-party patent application directed to methods for producing a recombinant lentiviral vector that could adversely affect the potential commercialization of AXO-Lenti-PD. While we do not believe that any such claims that would cover the methods of making AXO-Lenti-PD are patentable, we may be incorrect in this belief.

If we breach any of our license or collaboration agreements, it could compromise our development and commercialization efforts for our product candidates.

We have licensed rights to intellectual property from third parties in order to commercialize our product candidates, and, in the case of AXO-Lenti-PD, intend to enter into commercial supply and manufacturing agreements with Oxford BioMedica. In particular, our product candidate AXO-Lenti-PD is dependent on the Oxford BioMedica Agreement. Pursuant to such agreement, we received from Oxford BioMedica a worldwide, exclusive, royalty-bearing, sub-licensable license under certain patents and other intellectual property controlled by Oxford BioMedica to develop and commercialize AXO-Lenti-PD and related gene therapy products for all diseases and conditions. We also received from Oxford BioMedica an exclusive option to obtain a worldwide license to other patents and know-how controlled by Oxford BioMedica related to certain technology processes. Under the terms of the Oxford BioMedica Agreement, we and Oxford BioMedica have each agreed to customary non-compete restrictions limiting our respective abilities to develop certain directly-competing gene therapy products. We are solely responsible, at our expense, for all activities related to the development and commercialization of the Gene Therapy Products under the license. We must provide Oxford BioMedica with regular forecasts and updates with respect to our development and commercialization activities. We are required to use commercially reasonable efforts to develop, obtain regulatory approval of, and commercialize a Gene Therapy Product in the United States and at least one major market country in Europe. We are required to meet certain diligence milestones relating to clinical site selection, obtaining regulatory advice for a Gene Therapy Product, and inclusion of at least one U.S. based clinical site in a pivotal study of a Gene Therapy Product. Disputes may arise between us and any of these counterparties regarding intellectual property rights that are subject to such agreements, including, but not limited to:

- the scope of rights granted under the agreement and other interpretation-related issues;
- whether and the extent to which our technology and processes infringe on intellectual property of the licensor that is not subject to the agreement;
- our right to sublicense patent and other rights to third parties;
- our diligence obligations with respect to the use of the licensed technology in relation to our development and commercialization of our product candidates, and what activities satisfy those diligence obligations;
- the ownership of inventions and know-how resulting from the joint creation or use of intellectual property by our licensors and us and our partners;
- our right to transfer or assign our license; and
- the effects of termination.

These or other disputes over intellectual property that we have licensed (or will license or acquire in the future) may prevent or impair our ability to maintain our current arrangements on acceptable terms, or may impair the value of the arrangement to us. Any such dispute could have an adverse effect on our business.

If we materially breach or fail to perform any provision under these license and collaboration agreements, including failure to make payments to a licensor or collaborator when due for royalties and failure to use commercially reasonable efforts to develop and commercialize our product candidates, such as AXO-Lenti-PD, such licensors and collaborators have the right to terminate our agreement, and upon the effective date of such termination, our right to practice the licensed patent rights and other intellectual property would end. Any uncured, material breach under the agreements could result in our loss of rights to practice the patent rights and other intellectual property licensed to us under the agreements.

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We may be involved in lawsuits to protect or enforce our patents, the patents of our licensors or our other 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 legal claims, which can be expensive and time-consuming. In addition, in an infringement proceeding, a court may decide that a patent of ours or our licensors is not valid or is unenforceable, or may refuse to stop the other party from using the technology at issue on the grounds that our patents do not cover the technology in question. An adverse result in any litigation or defense proceedings could put one or more of our patents at risk of being invalidated or interpreted narrowly and could put our patent applications at risk of not issuing. The initiation of a claim against a third party may also cause the third party to bring counter claims against us such as claims asserting that our patents are invalid or unenforceable.

In patent litigation in the United States, defendant counterclaims alleging invalidity or unenforceability are commonplace. Grounds for a validity challenge could be an alleged failure to meet any of several statutory requirements, including lack of novelty, obviousness, non-enablement, lack of written description or lack of statutory subject matter. Grounds for an unenforceability assertion could be an allegation that someone connected with prosecution of the patent withheld relevant material information from the USPTO, or made a materially misleading statement, during prosecution. Third parties may also raise similar validity claims before the USPTO in post-grant proceedings such as ex parte reexaminations, inter partes review, or post-grant review, or oppositions or similar proceedings outside the United States, in parallel with litigation or even outside the context of litigation. The outcome following legal assertions of invalidity and unenforceability is unpredictable. We cannot be certain that there is no invalidating prior art, of which we and the patent examiner were unaware during prosecution. For the patents and patent applications that we have licensed, we may have limited or no right to participate in the defense of any licensed patents against challenge by a third party. If a defendant were to prevail on a legal assertion of invalidity or unenforceability, we would lose at least part, and perhaps all, of any future patent protection on our current or future product candidates. Such a loss of patent protection could harm our business.

We may not be able to prevent, alone or with our licensors, misappropriation of our intellectual property rights, particularly in countries where the laws may not protect those rights as fully as in the United States. Our business could be harmed if in litigation the prevailing party does not offer us a license on commercially reasonable terms. Any litigation or other proceedings to enforce our intellectual property rights may fail, and even if successful, may result in substantial costs and distract our management and other employees.

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

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

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

Changes in U.S. patent law or the patent law of other countries could diminish the value of patents in general, thereby impairing our ability to protect our products.

As discussed above, the Leahy-Smith Act introduced procedures for challenging the validity of U.S. patents after they have issued. The U.S. Supreme Court has ruled on several patent cases in recent years, either narrowing the scope of patent protection available in certain circumstances or weakening the rights of patent owners in certain situations. In addition to increasing uncertainty with regard to our ability to obtain patents in the future, this combination of events has created uncertainty with respect to the value of patents, once obtained. Depending on actions by the U.S. Congress, the federal courts, and the USPTO, the laws and regulations governing patents could change in

unpredictable ways that would weaken our ability to obtain new patents or to enforce patents that we have licensed or that we might obtain in the future. Similarly, changes in patent law and regulations in other countries or jurisdictions or changes in the governmental bodies that enforce them or changes in how the relevant governmental authority enforces patent laws or regulations may weaken our ability to obtain new patents or to enforce patents that we have licensed or that we may obtain in the future.

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The United States federal government retains certain rights in inventions produced with its financial assistance under the Bayh-Dole Act. The federal government retains a "nonexclusive, nontransferable, irrevocable, paid-up license" for its own benefit. The Bayh-Dole Act also provides federal agencies with "march-in rights". March-in rights allow the government, in specified circumstances, to require the contractor or successors in title to the patent to grant a "nonexclusive, partially exclusive, or exclusive license" to a "responsible applicant or applicants." If the patent owner refuses to do so, the government may grant the license itself.

We may not be able to protect our intellectual property rights throughout the world, which could impair our business. Filing, prosecuting and defending patents covering our product candidates throughout the world would be prohibitively expensive and our intellectual property rights outside of the United States can be less extensive than those in the United States. 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 may obtain patent protection, but where patent enforcement is not as strong as that in the United States. These products may compete with our products in jurisdictions where we do not have any issued or licensed patents and any future 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. The legal systems of some countries do not favor the enforcement of patents and other intellectual property protection, which could make it difficult for us to stop the infringement of our patents generally. Proceedings to enforce our patent rights in foreign jurisdictions could result in substantial costs and divert our efforts and attention from other aspects of our business, could put our patents at risk of being invalidated or interpreted narrowly and our patent applications at risk of not issuing and could provoke third parties to assert claims against us. We may not prevail in any lawsuits that we initiate, and the damages or other remedies awarded, if any, may not be commercially meaningful.

Many countries, including European Union countries, India, Japan and China, have compulsory licensing laws under which a patent owner may be compelled under specified circumstances to grant licenses to third parties. In those countries, we may have limited remedies if patents are infringed or if we are compelled to grant a license to a third party, which could materially diminish the value of those patents. This could limit our potential revenue opportunities. Accordingly, our efforts to enforce our intellectual property rights around the world may be inadequate to obtain a significant commercial advantage from the intellectual property that we develop or license.

Our reliance on third parties requires us to share our trade secrets and other proprietary information, which increases the possibility that a competitor will discover them or that our trade secrets will be misappropriated or disclosed. Because we expect to rely on third parties to manufacture our product candidates, and we expect to collaborate with third parties on the development of our product candidates, we must, at times, share trade secrets and other proprietary information with them. We also conduct joint research and development programs that may require us to share trade secrets and other proprietary information under the terms of our research and development partnerships or similar agreements. We seek to protect our proprietary technology in part by entering into confidentiality agreements and, if applicable, material transfer agreements, consulting agreements or other similar agreements with our advisors, employees, third-party contractors and consultants prior to beginning research or disclosing proprietary information. These agreements typically limit the rights of the third parties to use or disclose our confidential information, including our trade secrets. Despite the contractual provisions employed when working with third parties, the need to share trade secrets and other confidential information increases the risk that such proprietary information becomes known by our competitors, is inadvertently incorporated into the technology of others, or is disclosed or used in violation of these agreements. Any disclosure, either intentional or unintentional, by our employees, the employees of third parties with whom we share our facilities or third-party consultants and vendors that we engage to perform research, clinical trials or manufacturing activities, or misappropriation by third parties (such as through a cybersecurity breach) of our trade secrets or proprietary information could enable competitors to duplicate or surpass our technological achievements, thus eroding our competitive position in our market. Further, adequate remedies may not exist in the event of unauthorized use or disclosure. Given that our proprietary position is based, in part, on our know-how and trade secrets, a competitor's discovery of our trade secrets or other unauthorized use or disclosure

would impair our competitive position and may have an adverse effect on our business and results of operations.

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In addition, these agreements typically restrict the ability of our advisors, employees, third-party contractors and consultants to publish data potentially relating to our trade secrets, although our agreements may contain certain limited publication rights. Policing unauthorized use of our or our licensors' intellectual property is difficult, expensive and time-consuming, and we may be unable to determine the extent of any unauthorized use. Moreover, enforcing a claim that a party illegally disclosed or misappropriated a trade secret is difficult, expensive and time-consuming, and the outcome is unpredictable. In addition, some courts inside and outside the United States are less willing or unwilling to protect trade secrets. Despite our efforts to protect our confidential information, our competitors may discover our trade secrets, either through breach of our agreements with third parties, independent development or publication of information by any of our third-party collaborators. A competitor's discovery of our trade secrets would impair our competitive position and have an adverse impact on our business.

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

We employ individuals who were previously employed at other biotechnology or pharmaceutical companies. Although we seek to ensure that our employees and our licensors' employees and our consultants and independent contractors do not use the proprietary information or know-how of others in their work for us, we may be subject to claims that we or our employees, consultants or independent contractors have inadvertently or otherwise used or disclosed trade secrets, or other confidential information of our employees', consultants' or independent contractors' former employers, clients, or other third parties. We may also be subject to claims that former employers or other third parties have an ownership interest in our patents. Litigation may be necessary to defend against these claims. There is no guarantee of success in defending these claims, and if we fail in defending any such claims, in addition to paying monetary damages, we may lose valuable intellectual property rights, such as exclusive ownership of, or right to use, valuable intellectual property. Even if we are successful, litigation could result in substantial cost and be a distraction to our management and other employees. Moreover, any such litigation or the threat thereof may adversely affect our reputation, our ability to form strategic alliances or sublicense our rights to collaborators, engage with scientific advisors or hire employees or consultants, each of which would have an adverse effect on our business, results of operations and financial condition.

In addition, while it is our policy to require our employees and contractors who may be involved in the development of intellectual property to execute agreements assigning such intellectual property to us, we may be unsuccessful in executing such an agreement with each party who in fact develops intellectual property that we regard as our own. Our and their assignment agreements may not be self-executing or may be breached, and we may be forced to bring claims against third parties, or defend claims they may bring against us, to determine the ownership of what we regard as our intellectual property.

If we or our licensors fail in prosecuting or defending any such claims, in addition to paying monetary damages, we may lose valuable intellectual property rights or personnel. Even if we and our licensors are successful in prosecuting or defending against such claims, litigation could result in substantial costs and be a distraction to management.

Intellectual property litigation could cause us to spend substantial resources and distract our personnel from their normal responsibilities.

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 management personnel from their normal responsibilities. In addition, there could be public announcements of the results of hearings, motions or other interim proceedings or developments and if securities analysts or investors perceive these results to be negative, it could have a substantial adverse effect on the price of our common shares. Such litigation or proceedings could substantially increase our operating losses and reduce the resources available for development activities or any future sales, marketing or distribution activities. We may not have sufficient financial or other resources to conduct such litigation or proceedings adequately. Some of our competitors may be able to sustain the costs of such litigation or proceedings more effectively than we can because of their greater financial resources. Some of our competitors are larger than we are and have substantially greater resources. They are, therefore, likely to be able to sustain the costs of complex patent litigation longer than we could. Accordingly, despite our efforts, we may not be able to prevent third parties from infringing upon or misappropriating our intellectual property. Litigation could result in substantial costs and

diversion of management resources, which could harm our business. In addition, the uncertainties associated with litigation could compromise our ability to raise the funds necessary to continue our clinical trials, continue our internal research programs, or in-license needed technology or other drug candidates. There could also be public announcements of the results of the hearing, motions, or other interim proceedings or developments. If securities analysts or investors perceive those results to be negative, it could cause the price of our common shares to decline. Uncertainties resulting from the initiation and continuation of patent litigation or other proceedings could compromise our ability to compete in the marketplace, including compromising our ability to raise the funds necessary to continue our clinical trials, continue our research programs, license necessary technology from third parties, or enter into development collaborations that would help us commercialize our drug candidates, if approved.

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If we are unable to protect the confidentiality of our trade secrets, our business and competitive position would be harmed.

In addition to seeking patents for our drug candidates, we also rely on trade secrets, including unpatented know-how, technology and other proprietary information, to maintain our competitive position. We seek to protect our trade secrets, in part, by entering into non-disclosure and confidentiality agreements with parties who have access to them, such as our employees, corporate collaborators, outside scientific collaborators, contract manufacturers, consultants, advisors and other third parties. We also enter into confidentiality and invention or patent assignment agreements with our employees and consultants. Despite these efforts, any of these parties may breach the agreements and disclose our proprietary information, including our trade secrets, and we may not be able to obtain adequate remedies for such breaches. Enforcing a claim that a party illegally disclosed or misappropriated a trade secret is difficult, expensive and time-consuming, and the outcome is unpredictable. In addition, some courts inside and outside the United States are less willing or unwilling to protect trade secrets. If any of our trade secrets were to be lawfully obtained or independently developed by a competitor, we would have no right to prevent them, or those to whom they communicate it, from using that technology or information to compete with us. If any of our trade secrets were to be disclosed to or independently developed by a competitor, our competitive position would be harmed.

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

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

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 formulations or compositions that are the same as or similar to our product candidates, but that are not covered by the claims of the patents that we own;
- others may be able to make product that is similar to product candidates we intend to commercialize that is not covered by the patents that we exclusively licensed and have the right to enforce;
- we, our licensor or any collaborators might not have been the first to make the inventions covered by the issued patents or pending patent applications that we own;
- we or our licensor might not have been the first to file patent applications covering certain of our inventions;
- others may independently develop similar or alternative technologies or duplicate any of our technologies without infringing our intellectual property rights;
- it is possible that our pending patent applications will not lead to issued patents;
- issued patents that we own may not provide us with any competitive advantages, or may be held invalid or unenforceable as a result of legal challenges;
- our competitors might conduct research and development activities in the United States and other countries that provide a safe harbor from patent infringement claims for certain research and development activities, as well as 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; and
- we may not develop additional proprietary technologies that are patentable.

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Risks Related to Our Common Shares

An active trading market for our common shares may not be sustained.

Although our common shares are listed on the Nasdaq Global Select Market, or Nasdaq, we cannot assure you that an active trading market for our common shares will continue to develop or be sustained. In addition, as a result of RSL owning approximately 69.6% of our common shares as of March 31, 2018, trading in our common shares may be less liquid than the shares of companies with broader public ownership. If an active market for our common shares is not sustained, you may not be able to sell your shares quickly or at the market price. An inactive market may also impair our ability to raise capital to continue to fund operations by selling common shares and may impair our ability to acquire other companies or technologies by using our common shares as consideration.

The market price of our common shares has been and is likely to continue to be highly volatile, and you may lose some or all of your investment.

The market price of our common shares has been and is likely to continue to be highly volatile and may be subject to wide fluctuations in response to a variety of factors, including the following:

- any additional delays in the commencement, enrollment and ultimate completion of our clinical trials;
- results of clinical trials of our product candidates or those of our competitors such as our recent announcement of the failure of our Phase 2b HEADWAY clinical trial of intepirdine in patients with DLB and the pilot Phase 2 Gait and Balance clinical trial of intepirdine in patients with dementia and gait impairment to meet their respective primary endpoints and the September 2017 announcement that our Phase 3 MINDSET clinical trial of intepirdine in patients with mild-to-moderate Alzheimer's disease did not meet its co-primary efficacy endpoints;
- any delay in filing applications for marketing approval of AXO-Lenti-PD, and any adverse development or perceived adverse development with respect to applicable regulatory authorities' review of those applications;
- failure to successfully develop and commercialize AXO-Lenti-PD or any other of our current or future product candidate;
- failure to maintain our relationship with Oxford BioMedica or comply with the terms of the Oxford BioMedica Agreement;
- inability to obtain additional funding;
- regulatory or legal developments in the United States and other countries applicable to our product candidates, including gene therapies;
- adverse regulatory decisions or statements;
- changes in the structure of healthcare payment systems;
- inability to obtain adequate product supply for our current product candidates or any future product candidate, or the inability to do so at acceptable prices;
- introduction of new products, services or technologies by our competitors;
- failure to meet or exceed financial projections we provide to the public;
- failure to meet or exceed the estimates and projections of the investment community;
- changes in the market valuations of similar companies;
- market conditions in the pharmaceutical and biotechnology sectors, and the issuance of new or changed securities analysts' reports or recommendations;
- announcements of significant acquisitions, strategic partnerships, joint ventures or capital commitments by us or our competitors;
- significant lawsuits, including patent or shareholder litigation, and disputes or other developments relating to our proprietary rights, including patents, litigation matters and our ability to obtain patent protection for our technologies;

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- additions or departures of key scientific or management personnel;
- short sales of our common shares;
- sales of our common shares by us or our shareholders in the future;
- negative coverage in the media or analyst reports, whether accurate or not;
- issuance of subpoenas or investigative demands, or the public fact of an investigation by a government agency, whether meritorious or not;
- trading volume of our common shares;
- general economic, industry and market conditions; and
- the other factors described in this "Risk Factors" section.

In addition, the stock markets have experienced extreme price and volume fluctuations that have affected and continue to affect the market prices of equity securities of many companies. These fluctuations have often been unrelated or disproportionate to the operating performance of those companies. Broad market and industry factors, as well as general economic, political, regulatory and market conditions, may negatively affect the market price of our common shares, regardless of our actual operating performance.

Volatility in our share price could subject us to securities class action litigation.

In the past, securities class action litigation has often been brought against a company following a decline in the market price of its securities and/or the discontinuation of development of a product candidate due to adverse clinical circumstances or results. This risk is especially relevant for us because pharmaceutical companies have experienced significant share price volatility in recent years. If we face such litigation, it could result in substantial costs and a diversion of management's attention and resources, which could harm our business.

We are a "controlled company" within the meaning of the applicable rules of the Nasdaq and, as a result, qualify for exemptions from certain corporate governance requirements. If we rely on these exemptions, you will not have the same protections afforded to shareholders of companies that are subject to such requirements.

RSL controls a majority of the voting power of our outstanding common shares. As a result, we are a "controlled company" within the meaning of the Nasdaq corporate governance requirements. Under these rules, a company of which more than 50% of the voting power for the election of directors is held by an individual, group or another company is a "controlled company" and may elect not to comply with certain corporate governance requirements, including the requirements:

- that a majority of its board of directors consists of independent directors;
- for an annual performance evaluation of the nominating and corporate governance and compensation committees;
- to require director nominees to be selected, or recommended for the board of directors' selection, either by independent directors constituting a majority of the Board's independent directors in a vote in which only independent directors participate or a nominations committee comprised solely of independent directors; and
- to have a compensation committee that is composed entirely of independent directors with a written charter addressing the committee's purpose and responsibility.

We have elected to use certain of these exemptions and we may continue to use all or some of these exemptions in the future. As a result, you may not have the same protections afforded to shareholders of companies that are subject to all of the Nasdaq corporate governance requirements.

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RSL owns a significant percentage of our common shares and is able to exert significant control over matters subject to shareholder approval.

Based on common shares outstanding as of March 31, 2018, RSL beneficially owns approximately 69.6% of the voting power of our outstanding common shares and has the ability to substantially influence us through this ownership position. For example, RSL and its shareholders may be able to control elections of directors, issuance of equity, including to our employees under equity incentive plans, amendments of our organizational documents, or approval of any merger, sale of assets, or other major corporate transaction. RSL's interests may not always coincide with our corporate interests or the interests of other shareholders, and it may act in a manner with which you may not agree or that may not be in the best interests of our other shareholders. Further, RSL is a privately held company whose ownership and governance structure is not transparent to our other shareholders. There may be changes to the management or ownership of RSL that could impact RSL's interests in a way that may not coincide with our corporate interests or the interests of other shareholders. So long as RSL continues to own a significant amount of our equity, it will continue to be able to strongly influence or effectively control our decisions.

Our organizational and ownership structure may create significant conflicts of interests.

Our organizational and ownership structure involves a number of relationships that may give rise to certain conflicts of interest between us and minority holders of our common shares, on the one hand, and RSL and its shareholders, on the other hand. Certain of our directors and employees have equity interests in RSL and, accordingly, their interests may be aligned with RSL's interests, which may not always coincide with our corporate interests or the interests of our other shareholders. Further, our other shareholders may not have visibility into the RSL ownership of any of our directors or officers, which may change at any time through acquisition, disposition, dilution, or otherwise. Any change in our directors' or officers' RSL ownership could impact the interests of those holders.

In addition, we are party to certain related party agreements with RSL, RSI and RSG. These entities and their shareholders, including certain of our directors and employees, may have interests which differ from our interests or those of the minority holders of our common shares. For example, we are party to an information sharing and cooperation agreement with RSL pursuant to which RSL has granted us a right of first review on any potential dementia-related product or investment opportunity that RSL may consider pursuing. It is possible that we could fail to pursue a product candidate under this agreement and that product candidate is then successfully developed and commercialized by RSL or one of its other subsidiaries or affiliates. Any material transaction between us and RSL, RSI or RSG is subject to our related party transaction policy, which requires prior approval of such transaction by our Audit Committee. To the extent we fail to appropriately deal with any such conflicts of interests, it could negatively impact our reputation and ability to raise additional funds and the willingness of counterparties to do business with us, all of which could have an adverse effect on our business, financial condition, results of operations and cash flows.

If securities or industry analysts cease to publish research or reports about our business, or publish negative reports about our business, our share price and trading volume could decline.

The trading market for our common shares depends, in part, on the research and reports that securities or industry analysts publish about us or our business. We do not have any control over these analysts. If our financial performance fails to meet analyst estimates or one or more of the analysts who cover us downgrade our common shares or change their opinion of our common shares, our share price would likely decline. If one or more of these analysts cease coverage of our company or fail to regularly publish reports on us, we could lose visibility in the financial markets, which could cause our share price or trading volume to decline.

Because we do not anticipate paying any cash dividends on our common shares in the foreseeable future, capital appreciation, if any, would be your sole source of gain.

We have never declared or paid any cash dividends on our common shares. We currently anticipate that we will retain future earnings for the development, operation and expansion of our business and do not anticipate declaring or paying any cash dividends for the foreseeable future. We are also subject to Bermuda legal constraints that may affect our ability to pay dividends on our common shares and make other payments. Additionally, our ability to pay dividends is currently restricted by the terms of the Loan Agreement. As a result, capital appreciation, if any, of our common shares would be your sole source of gain on an investment in our common shares for the foreseeable future.

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Future sales of our common shares, or the perception that such sales may occur, could depress our share price, even if our business is doing well.

Sales of a substantial number of our common shares in the public market, or the perception by investors that our shareholders intend to sell substantial amounts of our common shares in the public market, could depress the market price of our common shares, even if our business is doing well. Such a decrease in our share price could in turn impair our ability to raise capital through the sale of additional equity securities.

All of the shares sold in our IPO and our follow-on offering described below, as well as shares issued upon the exercise of options granted to persons other than our officers and directors, are freely transferable without restrictions or further registration under the Securities Act of 1933, as amended, or the Securities Act. As of March 31, 2018, 75,000,000 of our outstanding common shares, representing a majority of our common shares, were held by RSL. If RSL or any of our executive officers or directors were to sell our common shares, or if the market perceived that RSL or any of our executive officers or directors intend to sell our common shares, it could negatively affect our share price. Prior to RSL's corporate reorganization and recapitalization in December 2015, any decision by RSL to sell or otherwise dispose of our shares required the unanimous agreement of all of the directors of RSL, including Vivek Ramaswamy, our director and former principal executive officer. Subsequent to RSL's corporate reorganization and recapitalization in December 2015, any such decision no longer requires a unanimous vote of RSL's directors, meaning that all or a portion of the shares of our common stock held by RSL may be sold without Vivek Ramaswamy's consent. However, any such sales must still be made in compliance with the Securities Act and the rules and regulations thereunder, which could limit the number of our shares that RSL could sell in any 90-day period.

We have filed registration statements on Form S-8 under the Securities Act to register the common shares that may be issued under our equity incentive plans from time to time. Shares registered under these registration statements are available for sale in the public market subject to vesting arrangements and exercise of options, as well as Rule 144 in the case of our affiliates. We also filed a "shelf" registration statement on Form S-3 under the Securities Act in December 2016, allowing us, from time to time, to offer up to $750 million of any combination of registered common shares, preferred shares, debt securities and warrants. In April 2017, we offered and sold approximately $134.5 million of our common shares, net of underwriting discounts and commissions and offering expenses, pursuant to this registration statement.

We have incurred and will continue to incur substantial costs as a result of operating as a public company, and our management has been and will be required to continue to devote substantial time to compliance with our public company responsibilities and corporate governance practices.

As a public company, we have incurred and will continue to incur significant legal, accounting and other expenses. The Sarbanes-Oxley Act of 2002, the Dodd-Frank Wall Street Reform and Consumer Protection Act, the listing requirements of Nasdaq and other applicable securities rules and regulations impose various requirements on public companies. Our management and other personnel devote a substantial amount of time to compliance with these requirements. Moreover, changing rules and regulations may increase our legal and financial compliance costs and make some activities more time-consuming and costly. If, notwithstanding our efforts to comply with new or changing laws, regulations and standards, we fail to comply, regulatory authorities may initiate legal proceedings against us, and our business may be harmed.

Further, failure to comply with these laws, regulations and standards may make it more difficult and more expensive for us to obtain directors' and officers' liability insurance, which could make it more difficult for us to attract and retain qualified members of our Board of Directors or members of senior management.

If we are unable to maintain proper and effective internal controls over financial reporting and disclosure controls and procedures, investor confidence in our company and, as a result, the value of our common shares, may be adversely affected.

Effective internal controls over financial reporting are necessary for us to provide reliable financial reports and to protect from fraudulent, illegal or unauthorized transactions. Effective disclosure controls and procedures enable us to make timely and accurate disclosure of financial and non-financial information that we are required to disclose. If we cannot provide effective controls and reliable financial reports and other disclosures, our business and operating results could be harmed. We have in the past discovered, and may in the future discover, areas of our internal controls

over financial reporting or disclosure controls and procedures, that, even if effective, could be improved.

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For example, with respect to disclosure controls and procedures, in January 2018, we issued a press release disclosing clinical trial results that included an erroneous statistical value. We issued a correction the next day, and we are taking steps to further enhance controls over our clinical data disclosure process. We are required, pursuant to Section 404 of the Sarbanes-Oxley Act, to furnish a report by management on the effectiveness of our internal control over financial reporting as of the end of each fiscal year. Our independent registered public accounting firm will not be required to attest to the effectiveness of our internal control over financial reporting until our first annual report required to be filed with the SEC following the later of the date we are deemed to be a “large accelerated filer,” as defined in the Exchange Act, or the date we are no longer an “emerging growth company,” as defined in the JOBS Act.

If material weaknesses or control deficiencies occur or our disclosure controls and procedures are ineffective in the future, we may be unable to report our financial results or make other disclosures accurately on a timely basis, which could cause our reported financial results or other disclosures to be materially misstated and result in the loss of investor confidence and cause the market price of our common shares to decline.

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

We are an "emerging growth company," as defined in the JOBS Act. For as long as we continue to be an emerging growth company, we may take advantage of exemptions from various reporting requirements that are applicable to other public companies that are not emerging growth companies, including exemption from compliance with the auditor attestation requirements of Section 404, reduced disclosure obligations regarding executive compensation and exemptions from the requirements of holding a nonbinding advisory vote on executive compensation and shareholder approval of any golden parachute payments not previously approved. We will remain an emerging growth company until the earlier of (1) March 31, 2021, (2) the last day of the fiscal year in which we have total annual gross revenue of at least $1.07 billion, (3) the date on which we are deemed to be a "large accelerated filer," which means the market value of our common shares that are held by non-affiliates exceeds $700.0 million as of the prior September 30, the end of our second fiscal quarter, and (4) the date on which we have issued more than $1.0 billion in non-convertible debt during the prior three-year period.

In addition, under the JOBS Act, emerging growth companies can delay adopting new or revised accounting standards until such time as those standards apply to private companies. We have irrevocably elected not to avail ourselves of this exemption from new or revised accounting standards and, therefore, we will be subject to the same new or revised accounting standards as other public companies that are not emerging growth companies.

Even after we no longer qualify as an emerging growth company, we may still qualify as a “smaller reporting company” which would allow us to take advantage of many of the same exemptions from disclosure requirements including exemption from compliance with the auditor attestation requirements of Section 404 and reduced disclosure obligations regarding executive compensation in our periodic reports and proxy statements.

We cannot predict if investors will find our common shares less attractive because we may rely on these exemptions. If some investors find our common shares less attractive as a result, there may be a less active trading market for our common shares and our share price may be more volatile.

We are a Bermuda company and it may be difficult for you to enforce judgments against us or our directors and executive officers.

We are a Bermuda exempted company. As a result, the rights of our shareholders are governed by Bermuda law and our memorandum of association and bye-laws. The rights of shareholders under Bermuda law may differ from the rights of shareholders of companies incorporated in another jurisdiction. It may be difficult for investors to enforce in the United States judgments obtained in U.S. courts against us based on the civil liability provisions of the U.S. securities laws. It is doubtful whether courts in Bermuda will enforce judgments obtained in other jurisdictions, including the United States, against us or our directors or officers under the securities laws of those jurisdictions or entertain actions in Bermuda against us or our directors or officers under the securities laws of other jurisdictions.

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Bermuda law differs from the laws in effect in the United States and may afford less protection to our shareholders. We are organized under the laws of Bermuda. As a result, our corporate affairs are governed by the Bermuda Companies Act 1981, as amended, or the Companies Act, which differs in some material respects from laws typically applicable to U.S. corporations and shareholders, including the provisions relating to interested directors, amalgamations, mergers and acquisitions, takeovers, shareholder lawsuits and indemnification of directors. Generally, the duties of directors and officers of a Bermuda company are owed to the company only. Shareholders of Bermuda companies typically do not have rights to take action against directors or officers of the company and may only do so in limited circumstances. Shareholder class actions are not available under Bermuda law. The circumstances in which shareholder derivative actions may be available under Bermuda law are substantially more proscribed and less clear than they would be to shareholders of U.S. corporations. The Bermuda courts, however, would ordinarily be expected to permit a shareholder to commence an action in the name of a company to remedy a wrong to the company where the act complained of is alleged to be beyond the corporate power of the company or illegal, or would result in the violation of the company's memorandum of association or bye-laws. Furthermore, consideration would be given by a Bermuda court to acts that are alleged to constitute a fraud against the minority shareholders or, for instance, where an act requires the approval of a greater percentage of the company's shareholders than those who actually approved it. When the affairs of a company are being conducted in a manner that is oppressive or prejudicial to the interests of some shareholders, one or more shareholders may apply to the Supreme Court of Bermuda, which may make such order as it sees fit, including an order regulating the conduct of the company's affairs in the future or ordering the purchase of the shares of any shareholders by other shareholders or by the company. Additionally, under our bye-laws and as permitted by Bermuda law, each shareholder has waived any claim or right of action against our directors or officers for any action taken by directors or officers in the performance of their duties, except for actions involving fraud or dishonesty. In addition, the rights of our shareholders and the fiduciary responsibilities of our directors under Bermuda law are not as clearly established as under statutes or judicial precedent in existence in jurisdictions in the United States, particularly the State of Delaware. Therefore, our shareholders may have more difficulty protecting their interests than would shareholders of a corporation incorporated in a jurisdiction within the United States.

There are regulatory limitations on the ownership and transfer of our common shares.

Common shares may be offered or sold in Bermuda only in compliance with the provisions of the Companies Act and the Bermuda Investment Business Act 2003, which regulates the sale of securities in Bermuda. In addition, the Bermuda Monetary Authority must approve all issues and transfers of shares of a Bermuda exempted company. However, the Bermuda Monetary Authority has, pursuant to its statement of June 1, 2005, given its general permission under the Exchange Control Act 1972 and related regulations for the issue and free transfer of our common shares to and among persons who are non-residents of Bermuda for exchange control purposes as long as the shares are listed on an appointed stock exchange, which includes Nasdaq. Specific permission of the Bermuda Monetary Authority has also been obtained dated June 8, 2015 to the issue and transfer of our shares, options, warrants, depositary receipts, rights, loan notes, debt instruments and our other securities to persons resident and non-resident of Bermuda for exchange control purposes while our shares are listed on an appointed stock exchange. The general permission and the specific permission would cease to apply if we were to cease to be listed on Nasdaq or any other appointed stock exchange.

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Our bye-laws enable our board of directors to issue preference shares, which may discourage a change of control.
Our bye-laws contain provisions that enable our board of directors to determine the powers, preferences and rights of our preference shares and to issue the preference shares without shareholder approval.
This could discourage, delay or prevent a transaction involving a change in control of our company and may prevent our shareholders from receiving the benefit from any premium to the market price of our common shares offered by a bidder in a takeover context. Even in the absence of a takeover attempt, the existence of this provision may adversely affect the prevailing market price of our common shares if it is viewed as discouraging takeover attempts in the future.
We may reduce the voting power of your common shares without your consent.
Under our amended and restated bye-laws, in the event that any U.S. person holds, directly, indirectly or constructively, 9.5% or more of the total voting power of our issued share capital, excluding any U.S. person that held, directly, indirectly or constructively, 9.5% or more of the total voting power of issued share capital immediately prior to the closing of our IPO, the aggregate votes conferred by the common shares held by such person (or by any person through which such U.S. person indirectly or constructively holds shares) will be reduced by our Board of Directors to the extent necessary such that the common shares held, directly, indirectly or constructively, by such U.S. person will constitute less than 9.5% of the voting power of all issued and outstanding shares. RSL, certain of its affiliates, and Vivek Ramaswamy, our founder and former principal executive officer, will not be subject to these provisions. Further, our Board of Directors may determine that shares shall carry different or no voting rights as it reasonably determines, based on the advice of counsel, to be appropriate to (1) avoid the existence of any U.S. person who holds 9.5% or more of the total voting power of our issued share capital or (2) avoid adverse tax, legal or regulatory consequences to us, any subsidiary of ours or any holder of our common shares or its affiliates.
These provisions may discourage potential investors from acquiring a stake or making a significant investment in our company as well as discourage a takeover attempt, which may prevent our shareholders from receiving the benefit of any such transactions as well as adversely affect the prevailing market price of our common shares if viewed as discouraging takeover attempts in the future.

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We may become subject to unanticipated tax liabilities and higher effective tax rates.

We are incorporated under the laws of Bermuda, where we are not subject to any income or withholding taxes. We are centrally managed and controlled in the United Kingdom, and under current U. K. tax law, a company which is centrally managed and controlled in the United Kingdom is regarded as resident in the United Kingdom for taxation purposes. We may also become subject to income, withholding or other taxes in certain jurisdictions by reason of our activities and operations, and it is also possible that taxing authorities in any such jurisdictions could assert that we are subject to greater taxation than we currently anticipate. Any such additional tax liability could adversely affect our results of operations. For example, ASG is our principal operating company for conducting our business and is the entity that holds our intellectual property rights, including AXO-Lenti-PD and nelotanserin. The establishment of this Swiss entity as our principal operating company and the transfer of our intellectual property rights to this entity may result in a higher overall effective tax rate.

The intended tax effects of our corporate structure and intercompany arrangements depend on the application of the tax laws of various jurisdictions and on how we operate our business.

We and RSL, our principal shareholder, are incorporated under the laws of Bermuda. We currently have subsidiaries in the United Kingdom, Switzerland and the United States. If we succeed in growing our business, we expect to conduct increased operations through our subsidiaries in various countries and tax jurisdictions in part through intercompany service agreements between us, our majority shareholder, RSL, and our subsidiaries. In that case, our corporate structure and intercompany transactions, including the manner in which we develop and use our intellectual property, will be organized so that we can achieve our business objectives in a tax-efficient manner and in compliance with applicable transfer pricing rules and regulations. If two or more affiliated companies are located in different countries or tax jurisdictions, the tax laws and regulations of each country generally will require that transfer prices be the same as those between unrelated companies dealing at arms' length and that appropriate documentation be maintained to support the transfer prices. While we believe that we operate in compliance with applicable transfer pricing laws and intend to continue to do so, our transfer pricing procedures are not binding on applicable tax authorities.

Significant judgment is required in evaluating our tax positions and determining our provision for income taxes. During the ordinary course of business, there are many transactions and calculations for which the ultimate tax determination is uncertain. For example, our effective tax rates could be adversely affected by changes in foreign currency exchange rates or by changes in the relevant tax, accounting, and other laws, regulations, principles, and interpretations. As we intend to operate in numerous countries and taxing jurisdictions, the application of tax laws can be subject to diverging and sometimes conflicting interpretations by tax authorities of these jurisdictions. It is not uncommon for taxing authorities in different countries to have conflicting views, for instance, with respect to, among other things, the manner in which the arm's length standard is applied for transfer pricing purposes, or with respect to the valuation of intellectual property. In addition, tax laws are dynamic and subject to change as new laws are passed and new interpretations of the law are issued or applied. For example, on December 22, 2017, an Act to provide for reconciliation pursuant to titles II and V of the concurrent resolution on the budget for fiscal year 2018 (commonly known as the Tax Cuts and Jobs Act) was enacted in the United States, which introduced a comprehensive set of tax reforms. We continue to assess the impact of such tax reform legislation on our business and may determine that changes to our structure, practice or tax positions are necessary in light of the Tax Cuts and Jobs Act. Certain impacts of this legislation have been taken into account, including the reduction of the U.S. corporate income tax rate from the previous 35 percent to 21 percent. The Tax Cuts and Jobs Act, in conjunction with the tax laws of other jurisdictions in which we operate, however, may require consideration of changes to our structure and the manner in which we conduct our business. Such changes may nevertheless be ineffective in avoiding an increase in our consolidated tax liability, which could adversely affect our financial condition, results of operations and cash flows.

If tax authorities in any of these countries were to successfully challenge our transfer prices as not reflecting arms' length transactions, they could require us to adjust our transfer prices and thereby reallocate our income to reflect these revised transfer prices, which could result in a higher tax liability to us. In addition, if the country from which the income is reallocated does not agree with the reallocation, both countries could tax the same income, potentially resulting in double taxation. If tax authorities were to allocate income to a higher tax jurisdiction, subject our income

to double taxation or assess interest and penalties, it would increase our consolidated tax liability, which could adversely affect our financial condition, results of operations and cash flows.

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Changes in our effective tax rate may reduce our net income in future periods.

Our tax position could be adversely impacted by changes in tax rates, tax laws, tax practice, tax treaties or tax regulations or changes in the interpretation thereof by the tax authorities in Europe (including the United Kingdom and Switzerland), the United States, Bermuda and other jurisdictions as well as being affected by certain changes currently proposed by the Organisation for Economic Co-operation and Development and their action plan on Base Erosion and Profit Shifting. Such changes may become more likely as a result of recent economic trends in the jurisdictions in which we operate, particularly if such trends continue. If such a situation was to arise, it could adversely impact our tax position and our effective tax rate. Failure to manage the risks associated with such changes, or misinterpretation of the laws providing such changes, could result in costly audits, interest, penalties and reputational damage, which could adversely affect our business, results of our operations and our financial condition.

Our actual effective tax rate may vary from our expectation and that variance may be material. A number of factors may increase our future effective tax rates, including: (1) the jurisdictions in which profits are determined to be earned and taxed; (2) the resolution of issues arising from any future tax audits with various tax authorities; (3) changes in the valuation of our deferred tax assets and liabilities; (4) increases in expenses not deductible for tax purposes, including transaction costs and impairments of goodwill in connection with acquisitions; (5) changes in the taxation of share-based compensation; (6) changes in tax laws or the interpretation of such tax laws, and changes in generally accepted accounting principles; and (7) challenges to the transfer pricing policies related to our structure.

U.S. holders that own 10 percent or more of the vote or value of our common shares may suffer adverse tax consequences because we and/or any of our non-U.S. subsidiaries are expected to be characterized as a controlled foreign corporation (“CFC”) under Section 957(a) of the U.S. Internal Revenue Code of 1986, as amended (“the Code”). A non-U.S. corporation is considered a CFC if more than 50 percent of (1) the total combined voting power of all classes of stock of such corporation entitled to vote, or (2) the total value of the stock of such corporation, is owned, or is considered as owned by applying certain constructive ownership rules, by United States shareholders (U.S. persons who own stock representing 10% or more of the vote or, for taxable years of non-U.S. corporations beginning after December 31, 2017 and for taxable years of shareholders with or within which such taxable years of non-U.S. corporations end, 10% or more of the value) on any day during the taxable year of such non-U.S. corporation. Certain United States shareholders of a CFC generally are required to include currently in gross income such shareholders’ share of the CFC’s “Subpart F income”, a portion of the CFC’s earnings to the extent the CFC holds certain U.S. property, and a portion of the CFC's “global intangible low-taxed income” (as defined under Section 951A of the Code). Such United States shareholders are subject to current U.S. federal income tax with respect to such items, even if the CFC has not made an actual distribution to such shareholders. “Subpart F income” includes, among other things, certain passive income (such as income from dividends, interests, royalties, rents and annuities or gain from the sale of property that produces such types of income) and certain sales and services income arising in connection with transactions between the CFC and a person related to the CFC. “Global intangible low-taxed income” may include most of the remainder of a CFC’s income over a deemed return on its tangible assets.

As a result of certain changes in the U.S. tax law introduced by the Tax Cuts and Jobs Act, we believe that we and our non-U.S. subsidiaries are classified as CFCs in the current taxable year. For U.S. holders who hold 10% or more of the vote or value of our common shares, this may result in adverse U.S. federal income tax consequences, such as current U.S. taxation of Subpart F income and of any such shareholder’s share of our accumulated non-U.S. earnings and profits (regardless of whether we make any distributions), taxation of amounts treated as global intangible low-taxed income under Section 951A of the Code with respect to such shareholder, and being subject to certain reporting requirements with the U.S. Internal Revenue Service. Any such U.S. holder who is an individual generally would not be allowed certain tax deductions or foreign tax credits that would be allowed to a U.S. corporation. If you are a U.S. holder who holds 10% or more of the vote or value of our common shares, you should consult your own tax advisors regarding the U.S. tax consequences of acquiring, owning, or disposing our common shares and the impact of the Tax Cuts and Jobs Act, especially the changes to the rules relating to CFCs.

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U.S. holders of our common shares may suffer adverse tax consequences if we are characterized as a passive foreign investment company.

Generally, if, for any taxable year, at least 75% of our gross income is passive income, or at least 50% of the value of our assets is attributable to assets that produce passive income or are held for the production of passive income, including cash, we would be characterized as a passive foreign investment company, or PFIC, for U.S. federal income tax purposes. For purposes of these tests, passive income includes dividends, interest, and gains from the sale or exchange of investment property and rents and royalties other than rents and royalties which are received from unrelated parties in connection with the active conduct of a trade or business. Additionally, a look-through rule generally applies with respect to 25% or more owned subsidiaries. If we are characterized as a PFIC, U.S. holders of our common shares may suffer adverse tax consequences, including having gains realized on the sale of our common shares treated as ordinary income rather than capital gain, the loss of the preferential tax rate applicable to dividends received on our common shares by individuals who are U.S. holders, and having interest charges apply to distributions by us and the proceeds of sales of our common shares.

Our status as a PFIC will depend on the nature and composition of our income and the nature, composition and value of our assets from time to time. The 50% passive asset test described above is generally based on the fair market value of each asset, with the value of goodwill and going concern value determined in large part by reference to the market value of our common shares, which may be volatile. Our status may also depend, in part, on how quickly we utilize the cash proceeds from our IPO and subsequent financings in our business. With respect to the taxable year that ended on March 31, 2018, we believe that we were not a PFIC; however, with respect to foreseeable future taxable years, because the PFIC tests are based upon the value of our assets, including any goodwill and going concern value, and the nature and composition of our income and assets, which cannot be known at this time, we cannot predict whether we will or will not be classified as a PFIC. Because the determination of whether we are a PFIC for any taxable year is a fact-intensive determination made annually after the end of each taxable year, and because certain aspects of the PFIC rules are uncertain, we cannot provide any assurances regarding our PFIC status for the current or future taxable years.

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Item 1B. Unresolved Staff Comments

None.

Item 2. Properties

Our principal offices are located at Suite 1, 3rd Floor, 11-12 St. James's Square, London, United Kingdom SW1Y 4LB and our registered office is located at Clarendon House, 2 Church Street, Hamilton HM 11, Bermuda. We also have business operations in Basel, Switzerland and in New York, NY. In June 2017, we entered into a license agreement for office space in New York, NY. This agreement expires in January 2019.

We believe that all of our facilities are in good condition and are well maintained and that our current arrangements will be sufficient to meet our needs for the foreseeable future and that any required additional space will be available on commercially reasonable terms to meet space requirements if they arise.

Item 3. Legal Proceedings

From time to time, we may become involved in legal proceedings relating to claims arising from the ordinary course of business. We are not currently a party to any material legal proceedings, and we are not aware of any pending or threatened legal proceeding against us that we believe could have an adverse effect on our business, operating results or financial condition.

Item 4. Mine Safety Disclosures

Not applicable.

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PART II.

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

Market Information for Common Shares

Our common shares began trading on the NYSE under the symbol “AXON” on June 11, 2015. Prior to that date, there was no public market for our common shares. Effective September 6, 2017, we changed our listing to the Nasdaq Global Select Market and began trading under the symbol “AXON”.

The following table reflects the range of the high and low sale price per common share, as reported on the Nasdaq Global Select Market and the NYSE as applicable, for the periods indicated. These prices reflect inter-dealer prices, without retail mark-up, mark-down or commission and may not necessarily represent actual transactions.

	Common Share Price	
	High	Low
Year Ended March 31, 2018		
First Quarter	$25.18	$14.70
Second Quarter	$27.98	$6.13
Third Quarter[1]	$8.01	$4.60
Fourth Quarter	$5.48	$1.32
Year Ended March 31, 2017		
First Quarter	$15.70	$10.69
Second Quarter	$17.66	$11.94
Third Quarter	$14.79	$11.01
Fourth Quarter	$15.80	$11.01
Year Ended March 31, 2016		
First Quarter[2]	$31.17	$18.18
Second Quarter	$22.88	$9.99
Third Quarter	$21.30	$11.01
Fourth Quarter	$18.33	$8.86

[1] Our common shares commenced trading on the Nasdaq Global Select Market on September 6, 2017 and ceased to be listed on the NYSE.

[2] Our common shares commenced trading on the NYSE on June 11, 2015.

Shareholders

American Stock Transfer & Trust Company is the transfer agent and registrar for our common shares. As of June 7, 2018, we had two holders of record of our common shares. The actual number of shareholders is greater than this number of record holders and includes shareholders who are beneficial owners but whose shares are held in street name by brokers and other nominees. This number of holders of record also does not include shareholders whose shares may be held in trust by other entities.

Dividend Policy

We have never declared or paid cash dividends on our common shares. We anticipate that we will retain all of our future earnings, if any, for use in the expansion and operation of our business and do not anticipate paying cash dividends in the foreseeable future. Payment of future dividends, if any, will be at the discretion of our Board of Directors. Additionally, our ability to pay dividends is currently restricted by the terms of the Loan Agreement with

Hercules.

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Share Price Performance Graph

The following graph illustrates a comparison of the total cumulative shareholder return for our common shares since market close on June 11, 2015, the date our common shares began trading on the NYSE, with the cumulative total returns of the S&P 500 Index and the Dow Jones US Pharmaceuticals & Biotechnology Index.

The graph assumes an initial investment of $100 at the closing price on June 11, 2015 in our common shares and in each of the indexes with relative performance tracked through March 31, 2018, assuming reinvestment of the full amount of all dividends, if any.

Historical shareholder return is not necessarily indicative of the performance to be expected for any future periods.

This performance graph shall not be deemed “filed” for purposes of Section 18 of the Exchange Act, or incorporated by reference into any of our filings under the Securities Act or the Exchange Act, except as shall be expressly set forth by specific reference in such filing.

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Recent Sales of Unregistered Securities

None.

Purchases of Equity Securities by the Issuer and Affiliated Parties

None.

Use of Proceeds from Initial Public Offering

On June 16, 2015, we closed our initial public offering ("IPO'') in which we issued and sold 24,150,000 common shares at a public offering price of $15.00 per common share (including 3,150,000 common shares sold pursuant to the exercise in full of the underwriters' option to purchase additional shares), for net proceeds of $334.5 million, after deducting underwriting discounts and commissions and offering expenses payable by us.

All of the common shares issued and sold in our IPO were registered under the Securities Act pursuant to a registration statement on Form S-1, as amended (Registration No. 333-204073), which was declared effective by the SEC on June 10, 2015. Jefferies LLC, Evercore Group L.L.C., RBC Capital Markets LLC, JMP Securities LLC and Robert W. Baird & Co. acted as underwriters.

No offering expenses were paid directly or indirectly to any of our directors or officers (or their associates) or persons owning ten percent or more of any class of our equity securities or to any of our other affiliates.

As of March 31, 2018, we have used all of the net proceeds from the IPO, primarily to fund the nonclinical and clinical development of intepirdine and nelotanserin, to expand our internal research and development capabilities, and for general corporate purposes.

Such uses are consistent with the planned use of proceeds described in our prospectus dated June 10, 2015, filed with the SEC on June 11, 2015 pursuant to Rule 424(b) under the Securities Act.

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Item 6. Selected Financial Data

In the table below, we provide you with our selected consolidated financial data for the periods presented. The information has been derived from our audited consolidated financial statements found elsewhere in this Annual Report on Form 10-K and in the other reports we have filed with the SEC under the Exchange Act. You should read the following selected consolidated financial data in conjunction with our consolidated financial statements and related notes included in this Annual Report on Form 10-K and "Item 7—Management's Discussion and Analysis of Financial Condition and Results of Operations" of this Annual Report on Form 10-K. The selected financial data in this section are not intended to replace our consolidated financial statements and the related notes. Our historical results are not necessarily indicative of our future results.

	Years Ended March 31,			Period from October 31, 2014 (Date of Inception) to March 31,
	2018	2017	2016	2015
Statements of Operations Data	(In thousands, except share and per share data)			
Operating expenses:				
Research and development expenses (includes $16,597, $19,186, $30,622 and $3,178 of share-based compensation expense for the years ended March 31, 2018, 2017 and 2016 and the period from October 31, 2014 (Date of Inception) to March 31, 2015, respectively)	$141,412	$134,778	$76,644	$14,324
General and administrative expenses (includes $15,281, $17,184, $41,764 and $5,118 of share-based compensation expense for the years ended March 31, 2018, 2017 and 2016 and the period from October 31, 2014 (Date of Inception) to March 31, 2015, respectively)	71,906	45,721	56,518	6,722
Total operating expenses	213,318	180,499	133,162	21,046
Interest expense	7,545	1,143	—	—
Other (income) expense	(211)	369	—	—
Loss before income tax expense (benefit)	(220,652)	(182,011)	(133,162)	(21,046)
Income tax expense (benefit)	921	(1,060)	(17)	1
Net loss	$(221,573)	$(180,951)	$(133,145)	$(21,047)
Net loss per common share — basic and diluted	$(2.06)	$(1.82)	$(1.41)	$(1.32)
Weighted average common shares outstanding — basic and diluted	107,375,927	99,158,699	94,465,164	15,986,842

	As of March 31,			
	2018	2017	2016	2015
Balance Sheet Data:	(In thousands)			
Cash	$154,337	$212,573	$276,251	$ —
Working capital	111,687	173,422	266,331	(2,760)
Total assets	160,786	222,539	282,498	1,117
Long-term liabilities	42,925	51,436	—	5,000
Accumulated deficit	(556,951)	(335,143)	(154,192)	(21,047)
Total shareholders' equity (deficit)	71,286	124,837	266,743	(7,751)

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

The following discussion and analysis of our financial condition and results of operations should be read in conjunction with the audited consolidated financial statements and the related notes thereto included elsewhere in this Annual Report on Form 10-K.

Overview

We are a clinical-stage biopharmaceutical company focused on the acquisition, development and commercialization of novel therapeutics in the fields of neurology and psychiatry. We are developing a pipeline of clinical and nonclinical product candidates that focuses on the various aspects of debilitating neurodegenerative diseases such as Parkinson's disease, Alzheimer's disease, LBD, and other indications in the fields of neurology and psychiatry. Our goal is to be the leading biopharmaceutical company focused on the fields of neurology and psychiatry.

Our near-term focus is to develop our gene therapy product candidate, AXO-Lenti-PD, as a one-time treatment for Parkinson's disease. We intend to begin a Phase 1/2 study of AXO-Lenti-PD in advanced Parkinson's disease patients before the end of 2018. Prior to the recent in-licensing of AXO-Lenti-PD in June 2018, our primary focus has been on developing nelotanserin, a selective inverse agonist of the 5-$HT2_A$ receptor, and intepirdine, an antagonist of the 5-HT_6 receptor. In January 2018, we announced the results of a pilot Phase 2 Visual Hallucination study of nelotanserin in patients with LBD. We plan to make a determination of the overall development strategy for nelotanserin once we have reviewed final data from our currently ongoing Phase 2 study of nelotanserin in REM Sleep Behavior Disorder and have completed our ongoing comprehensive clinical, regulatory and commercial review. In addition, we will determine our development plans for RVT-104, a combination of rivastigmine and a peripheral muscarinic receptor antagonist, as a potential treatment for patients with Alzheimer's disease or DLB, once we have completed our ongoing comprehensive clinical, regulatory and commercial review in the context of our recent acquisition of AXO-Lenti-PD and any other newly acquired assets.

In January 2018, we announced the discontinuation of our development of intepirdine following our announcement that neither Phase 2b HEADWAY clinical trial of intepirdine in patients with DLB nor the pilot Phase 2 Gait and Balance clinical trial of intepirdine in patients with dementia and gait impairment met their respective primary endpoints and the September 2017 announcement that our Phase 3 MINDSET clinical trial of intepirdine in patients with mild-to-moderate Alzheimer's disease did not meet its co-primary efficacy endpoints. Following the announcement of Phase 3 MINDSET clinical trial results, we also discontinued further development of RVT-103 which had been intended for use in combination with intepirdine.

We have determined that we have one operating and reporting segment.

We were founded in October 2014 and our operations to date have been limited to organizing and staffing our company, raising capital, acquiring our product candidates and advancing our lead product candidates, intepirdine and nelotanserin, into clinical development. In June 2015, we completed our IPO, from which we raised net proceeds of $334.5 million, after deducting underwriting discounts and commissions and offering expenses. In February 2017, we and our subsidiaries entered into a loan and security agreement with Hercules, from which we raised net proceeds of $53.5 million. In April 2017, we completed a follow-on public offering of our common shares, from which we raised net proceeds of approximately $134.5 million, after deducting underwriting discounts and commissions and offering expenses. On June 5, 2018, we entered into a share purchase agreement with RSL, our majority shareholder, pursuant to which we agreed to issue and sell to RSL 14,285,714 common shares at a purchase price of $1.75 per common share in a private placement for expected aggregate gross proceeds of approximately $25 million. The share purchase agreement includes customary representations, warranties and covenants. Closing of this private placement is subject to satisfaction or waiver of customary closing conditions, including the lapse of a 20-day period following the mailing by us of an information statement relating to the private placement to our shareholders. The anticipated net proceeds from this private placement, together with the proceeds raised to date, are intended to fund our existing planned clinical development programs, the clinical development of AXO-Lenti-PD as well as additional business development activities, for working capital and other general corporate purposes.

To date, we have not generated any revenue and we recorded net losses of $221.6 million, $181.0 million and $133.1 million for the years ended March 31, 2018, 2017 and 2016, respectively.

Our products in development, their stage of development, their mechanism of action and the indications for which they are intended to address are described in more detail in the section titled “Business” in Part I, Item 1. of this Annual Report on Form 10-K.

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Oxford BioMedica License Agreement

On June 5, 2018, we, through our wholly-owned subsidiary, ASG, entered into the Oxford BioMedica Agreement, pursuant to which we received a worldwide, exclusive, royalty-bearing, sub-licensable license under certain patents and other intellectual property controlled by Oxford BioMedica to develop and commercialize AXO-Lenti-PD and related gene therapy products for all diseases and conditions. As partial consideration for the license, we will make an upfront payment to Oxford BioMedica of $30.0 million, $5.0 million of which will be applied as a credit against the process development work and clinical supply that Oxford BioMedica will provide to us. Under the terms of the Oxford BioMedica Agreement, we could be obligated to make payments to Oxford BioMedica totaling up to $55.0 million upon the achievement of specified development milestones and $757.5 million upon the achievement of specified regulatory and sales milestones. We will also be obligated to pay Oxford BioMedica a tiered royalty from 7% to 10%, based on yearly aggregate net sales of the Gene Therapy Products, subject to specified reductions upon the occurrence of certain events as set forth in the Oxford BioMedica Agreement. These royalties are required to be paid, on a product-by-product and country-by-country basis, until the latest to occur of the expiration of the last to expire valid claim of a licensed patent covering such product in such country, the expiration of regulatory exclusivity for such product in such country, or 10 years after the first commercial sale of such product in such country.

We are solely responsible, at our expense, for all activities related to the development and commercialization of the Gene Therapy Products. Pursuant to the Oxford BioMedica Agreement, we are required to use commercially reasonable efforts to develop, obtain regulatory approval of, and commercialize a Gene Therapy Product in the United States and at least one major market country in Europe. In addition, we are required to meet certain diligence milestones and to include at least one U.S.-based clinical trial site in a pivotal study of a Gene Therapy Product. If we fail to meet any of these specified development milestones, we may cure such failure by paying Oxford BioMedica certain fees, which range from $0.5 million to $1.0 million.

Arena Development Agreement for Nelotanserin

In October 2015, we exercised an option to acquire global rights, title, interest and obligations in and to nelotanserin from our majority shareholder, RSL. In May 2015, RSL entered into a development, marketing and supply agreement for nelotanserin with Arena and we entered into a Waiver and Option Agreement with RSL. Upon the exercise of our option, we assumed RSL's rights and obligations under the Arena Development Agreement, as amended October 18, 2017. In January 2018, we were notified by Arena that it has assigned all of its rights and obligations under the Arena Development Agreement to an affiliate, 125 Royalty Inc. Under the Waiver and Option Agreement, we recorded $5.3 million as research and development expense, which was 110% of any payments made to Arena by RSL, and any costs incurred by RSL in connection with the development of nelotanserin. We will be responsible for future contingent payments under the Arena Development Agreement, including up to $4.0 million in potential development milestone payments, up to $37.5 million in potential regulatory milestone payments and up to $60.0 million in potential commercial milestone payments. Under the Arena Development Agreement, we are also obligated to purchase all commercial supplies of nelotanserin from Arena for a fixed price equal to 15% of net sales of nelotanserin.

The Arena Development Agreement will remain in effect until terminated: (1) by the parties' mutual agreement; (2) for any reason by us upon 90 days' written notice to Arena; (3) by either party upon written notice for the other party's material breach or insolvency event if such party fails to cure such breach or the insolvency event is not dismissed within the specified cure period; or (4) by Arena if we or our affiliates participate in a challenge to certain Arena patents.

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Services Agreements with Roivant Sciences, Inc. and Roivant Sciences GmbH

In October 2014, we and our wholly-owned subsidiary, ASI, entered into a services agreement with RSI, a wholly-owned subsidiary of RSL, or the services agreement, pursuant to which RSI provides us with services in relation to the identification of potential product candidates and project management of clinical trials, as well as other services related to our development, administrative and financial functions. In February 2017, in connection with the contribution and assignment of all of our intellectual property rights to ASG, we amended and restated this services agreement effective as of December 13, 2016, as a result of which ASG was added as a recipient of services from RSI. In addition, ASG also entered into a separate services agreement with RSG, a wholly-owned subsidiary of RSL, effective as of December 13, 2016, for the provision of services by RSG to ASG in relation to the identification of potential product candidates and project management of clinical trials, as well as other services related to development, administrative and financial activities. Under the terms of both services agreements, we are obligated to pay or reimburse RSI and RSG for the costs they, or third parties acting on their behalf, incur in providing services to us, ASI or ASG, including administrative and support services as well as research and development services. In addition, we are obligated to pay to RSI and RSG at a pre-determined mark-up on the costs incurred directly by RSI and RSG in connection with any general and administrative and research and development services provided directly by RSI and RSG.

For the years ended March 31, 2018, 2017 and 2016, we incurred expenses of $8.5 million, $7.9 million and $7.6 million, respectively, inclusive of the mark-up, under the services agreements. We have recorded these charges as research and development expense and general and administrative expense in our consolidated statements of operations.

Roivant Financing

On June 5, 2018, we entered into a share purchase agreement (the “Purchase Agreement”) with RSL, our majority shareholder, pursuant to which we agreed to issue and sell to RSL 14,285,714 common shares at a purchase price of $1.75 per common share in a private placement (the “Private Placement”), equal to the per share closing price of our common shares on the Nasdaq Global Select Market on June 5, 2018. The Purchase Agreement includes customary representations, warranties and covenants. Closing of the Private Placement is subject to satisfaction or waiver of customary closing conditions, including the lapse of a 20-day period following the mailing by us of an information statement relating to the Private Placement to our shareholders. As of March 31, 2018, RSL held 69.6% of our outstanding common shares.

The aggregate gross proceeds to us from the Private Placement are expected to be approximately $25.0 million. We intend to use the net proceeds from the Private Placement to fund the clinical development of AXO-Lenti-PD as well as additional business development activities, for working capital and other general corporate purposes.

Loan and Security Agreement with Hercules Capital, Inc.

On February 2, 2017, we and our wholly-owned subsidiaries AHL, ASG and ASI entered into a loan and security agreement with Hercules as agent and lender, which was amended on May 24 and September 22, 2017. Pursuant to the Loan Agreement, we, AHL and ASG, as the borrowers, borrowed an aggregate of $55.0 million at the closing. On May 24, 2017, the Loan Agreement was amended such that the required minimum amount of unrestricted cash applied commencing on July 1, 2017 and is equal to the lesser of (i) $35.0 million (the “Applicable Amount”) plus certain aged accounts payable amounts (as further defined in the Loan Agreement) and (ii) the outstanding amount of debt under the Loan Agreement plus certain aged accounts payable (as further defined in the Loan Agreement), provided that the Applicable Amount may be lowered to $30 million upon the achievement of certain clinical milestones as set forth in the Loan Agreement.

ASI issued a guaranty of the borrowers’ obligations under the Loan Agreement and, at the closing, paid Hercules a facility charge of $550,000. The Term Loan bears interest at a variable per annum rate calculated for any day as the greater of either (i) the prime rate plus 6.80%, and (ii) 10.55%. Debt issuance fees paid to Hercules were recorded as a discount on the debt and are amortized to interest expense using the effective interest method over the life of the Loan Agreement. The Term Loan has a scheduled maturity date of March 1, 2021. The borrowers are obligated to make monthly payments of accrued interest under the Loan Agreement until September 1, 2018, followed by monthly installments of principal and interest through March 1, 2021. The interest-only period may be extended until either

March 2019 or September 2019 if, in each case, we achieve certain clinical development milestones, as set forth in the Loan Agreement. The borrowers' obligations under the Loan Agreement are secured by a first position lien on substantially all of their and ASI's respective assets, excluding intellectual property. Prepayment of the Term Loan is subject to penalty.

In connection with the entry into the Loan Agreement, we issued a warrant to Hercules, which was exercisable for an aggregate of 274,086 of our common shares at an exercise price of $12.04 per share. In August 2017, Hercules exercised the warrant on a cashless basis and received a net issuance of 129,827 of our common shares.

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The Loan Agreement includes customary affirmative and restrictive covenants and representations and warranties, including a minimum cash covenant, a covenant against the occurrence of a "change in control," financial reporting obligations, and certain limitations on the incurrence of indebtedness, liens (including a negative pledge on intellectual property and other assets), investments, distributions (including dividends), collateral, transfers, mergers or acquisitions, taxes, corporate changes, and deposit accounts. The Loan Agreement also includes customary events of default, including payment defaults, breaches of covenants following any applicable cure period, the occurrence of certain events that could reasonably be expected to have a "material adverse effect" as set forth in the Loan Agreement, cross acceleration to the debt and certain events relating to bankruptcy or insolvency. Upon the occurrence of an event of default, a default interest rate of an additional 5.0% may be applied to the outstanding principal balance, and Hercules may declare all outstanding obligations immediately due and payable and take such other actions as set forth in the Loan Agreement. As of March 31, 2018, the Company was in compliance with its covenants and obligations under the Loan Agreement.

In addition, for so long as the Term Loan remains outstanding, we are required to use commercially reasonable efforts to afford Hercules the opportunity to participate in future underwritten equity offerings of our common shares up to a total of $3.0 million.

Financial Operations Overview

Revenue

We have not generated any revenue from the sale of any products, and we do not expect to generate any revenue unless and until we obtain regulatory approval of and begin to commercialize one of our product candidates in development.

Research and Development Expense

Since our inception, our operations have primarily been focused on organizing and staffing our company; raising capital; and acquiring, preparing for and advancing our product candidates, intepirdine, nelotanserin, RVT-103 and RVT-104, into clinical development. Our research and development expenses include program-specific costs as well as unallocated internal costs.

Program-specific costs include:

- direct third-party costs, which include expenses incurred under agreements with CROs and contract manufacturing organizations, the cost of consultants who assist with the development of our product candidates on a program-specific basis, investigator grants, sponsored research, manufacturing costs in connection with producing materials for use in conducting nonclinical and clinical studies, and any other third-party expenses directly attributable to the development of our product candidates; and
- upfront payments for the purchase of in-process research and development, which include costs incurred under the GSK Agreement and the Arena Development Agreement.

Unallocated internal costs include:

- share-based compensation expense for research and development personnel, including expenses related to RSL common share awards and RSL options issued by RSL to RSI and RSG employees;
- personnel-related expenses, which include employee-related expenses, such as salaries, benefits and travel expenses, for research and development personnel;
- costs allocated to us under our services agreements with RSI and RSG; and
- other expenses, which includes the cost of consultants who assist with our research and development, but are not allocated to a specific program.

Research and development activities will continue to be central to our business model. We expect to continue to incur research and development expense as we wind down our MINDSET, HEADWAY and Gait and Balance trials of intepirdine, and our MINDSET and HEADWAY extension studies, and continue our development program for nelotanserin in LBD. However, due to the termination of the MINDSET, HEADWAY and Gait and Balance trials of intepirdine, we expect our overall research and development expense to decrease significantly for the foreseeable future until such time as we undertake additional development programs, including in relation to additional product candidates we may in-license or acquire as we pursue our updated business plan. We also expect our share-based compensation and other employee-related expenses for our research and development personnel to decrease as a result

of the recent reduction in headcount. For the years ended March 31, 2018, 2017 and 2016, the majority of our research and development expenses have been associated with advancing intepirdine. Our share-based compensation expense attributable to RSL common share awards has become less variable because of the December 2015 merger of BVC Ltd. (“BVC”) with and into RSL, a transaction we refer to in this report as the BVC Merger. Refer to Note 6 "Related Party Transactions," in the accompanying notes to our audited consolidated financial statements included elsewhere in this Annual Report on Form 10-K.

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

The duration, costs and timing of clinical trials of our products in development and any other product candidates will depend on a variety of factors that include, but are not limited to, the following:

- the number of trials required for approval;
- the per patient trial costs;
- the number of patients who participate in the trials;
- the number of sites included in the trials;
- the countries in which the trials are conducted;
- the length of time required to enroll eligible patients;
- the number of doses that patients receive;
- the drop-out or discontinuation rates of patients;
- the potential additional safety monitoring or other studies requested by regulatory agencies;
- the duration of patient follow-up;
- the timing and receipt of regulatory approvals; and
- the efficacy and safety profile of the product candidates.

In addition, the probability of success of our products in development and any other product candidate will depend on numerous factors, including competition, manufacturing capability and commercial viability. We may never succeed in achieving regulatory approval of our product candidates for any indication in any country. As a result of the uncertainties discussed above, we are unable to determine in advance the duration and completion costs of any clinical trial we conduct, or when and to what extent we will generate revenue from the commercialization and sale of our products in development or other product candidates, if at all.

General and Administrative Expense

General and administrative expenses consist primarily of share-based compensation, legal and accounting fees, consulting services, services received under the services agreements and employee-related expenses, such as employee salaries and benefits and travel expenses for general and administrative personnel.

We anticipate that our general and administrative expenses will decrease for the foreseeable future, primarily as the result of a recent reduction in share-based compensation and other employee-related expenses for our general and administrative personnel due to the recent reduction in headcount.

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Results of Operations for the Years Ended March 31, 2018, March 31, 2017 and March 31, 2016

The following table summarizes our results of operations for the years ended March 31, 2018, March 31, 2017 and March 31, 2016 (in thousands):

	Years Ended March 31,		
	2018	2017	2016
Operating expenses:			
Research and development expenses (includes $16,597, $19,186 and $30,622 of share-based compensation expense for the years ended March 31, 2018, 2017 and 2016, respectively)	$141,412	$134,778	$76,644
General and administrative expenses (includes $15,281, $17,184 and $41,764 of share-based compensation expense for the years ended March 31, 2018, 2017 and 2016, respectively)	71,906	45,721	56,518
Total operating expenses	213,318	180,499	133,162
Interest expense	7,545	1,143	—
Other (income) expense	(211)	369	—
Income tax expense (benefit)	921	(1,060)	(17)
Net loss	$(221,573)	$(180,951)	$(133,145)

Research and Development Expenses

For the years ended March 31, 2018, 2017 and 2016, the Company's research and development expenses consisted of the following (in thousands):

	Years Ended March 31,			Years Ended March 31,		
	2018	2017	Change	2017	2016	Change
Program-specific costs:						
Intepirdine	$80,243	$87,131	$(6,888)	$87,131	$28,010	$59,121
Nelotanserin	18,905	12,273	6,632	12,273	7,532	4,741
RVT-103	690	2,028	(1,338)	2,028	—	2,028
RVT-104	1,781	—	1,781	—	—	—
Unallocated internal costs:						
Share-based compensation	16,597	19,186	(2,589)	19,186	30,622	(11,436)
Personnel-related	15,376	9,443	5,933	9,443	4,707	4,736
Services agreements	2,689	2,961	(272)	2,961	5,136	(2,175)
Other	5,131	1,756	3,375	1,756	637	1,119
Total research and development expenses	$141,412	$134,778	$6,634	$134,778	$76,644	$58,134

Research and development expenses were $141.4 million for the year ended March 31, 2018, and consisted primarily of $80.2 million related to intepirdine clinical studies and related wind down activities, $18.9 million related to nelotanserin, share-based compensation of $16.6 million, personnel-related expenses of $15.4 million and other unallocated costs of $5.1 million. The share-based compensation expense includes $4.3 million related to the RSL common share awards and RSL options issued by RSL to RSI and RSG employees.

Research and development expenses increased by $6.6 million in the year ended March 31, 2018 as compared to the year ended March 31, 2017, as personnel-related expenses increased by $5.9 million resulting from increased headcount, employee severance and other personnel benefits and other expenses increased by $3.4 million due primarily to increased expenses for consultants. Program-specific costs increased by $0.2 million, as expenses related to intepirdine decreased by $6.9 million due to the recent discontinuation of our development program for intepirdine, partially offset by a $6.6 million increase in expenses related to nelotanserin.

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Research and development expenses were $134.8 million for the year ended March 31, 2017, and consisted primarily of $87.1 million related to intepirdine, share-based compensation expense of $19.2 million, $12.3 million related to nelotanserin, and personnel-related expenses of $9.4 million. Share-based compensation expense for the year ended March 31, 2017 includes share-based compensation expense of $9.2 million related to the RSL common share awards and RSL options issued by RSL to RSI and RSG employees.

Research and development expenses increased $58.1 million in the year ended March 31, 2017 as compared to the year ended March 31, 2016, primarily due to an increase in direct third-party costs of $71.1 million primarily related to our MINDSET study for intepirdine as a result of increased patient enrollment, offset by decreases in purchases of in-process research and development of $5.3 million and share-based compensation of $11.4 million.

Personnel-related expenses increased $4.7 million due to higher headcount, while expenses under our services agreements decreased primarily due to a decrease in research and development services provided by RSI on our behalf.

Research and development expenses were $76.6 million for the year ended March 31, 2016, and consisted primarily of share-based compensation of $30.6 million, $28.0 million related to intepirdine and $7.5 million related to nelotanserin including $5.3 million for the acquisition of nelotanserin. Share-based compensation expense for the year ended March 31, 2016 includes share-based compensation expense of $19.3 million related to the RSL common share awards and RSL options issued by RSL to RSI and RSG employees.

On December 4, 2015, BVC, a non-public entity, which held a non-controlling ownership interest in RSL, our majority shareholder, was merged with and into RSL, with RSL as the surviving entity. The compensation amounts of $19.3 million include share-based compensation expense for BVC awards issued to RSI employees prior to the BVC Merger. Prior to the BVC Merger, we recorded share-based compensation expense, in relation to the share-based awards issued by BVC to RSI employees based on the changes in fair value of BVC share-based awards. As these BVC share based awards were not based on our or RSL's shares, they were remeasured at each reporting period date until performance was completed.

As a result of the BVC Merger, all outstanding BVC share-based awards were converted into RSL common share awards, with the same vesting and forfeiture terms as the original grant. The RSL common share awards are fair valued on the date of grant and that fair value is recognized over the requisite service period. At the time of the BVC Merger on December 4, 2015, the unvested BVC awards that were converted into common shares of RSL were remeasured at the estimated fair value of RSL and that fair value is recognized over the remaining requisite service period. On December 8, 2015 following the BVC Merger, RSL had a recapitalization in conjunction with a private financing.

General and Administrative Expenses

General and administrative expenses were $71.9 million for the year ended March 31, 2018, and consisted of personnel expenses of $22.6 million, share-based compensation expense of $15.3 million, general operating costs of $11.9 million, marketing expenses of $9.3 million, professional fees of $7.0 million and direct and indirect costs of $5.8 million allocated to us under the services agreements. The share-based compensation expense includes $1.1 million for RSL common share awards and RSL options issued to RSI and RSG employees.

General and administrative expenses increased $26.2 million in the year ended March 31, 2018 as compared to the year ended March 31, 2017, as personnel-related expenses increased by $14.6 million resulting from increased headcount, employee severance and other personnel benefits, marketing expenses increased by $4.8 million related to pre-commercial launch activities and general operating costs increased by $5.8 million primarily due to increases in rent, amortization of leasehold improvements, consulting fees and travel associated with increased headcount.

General and administrative expenses were $45.7 million for the year ended March 31, 2017, and consisted primarily of share-based compensation expense of $17.2 million, personnel-related expenses of $7.9 million, professional fees of $5.0 million, $5.0 million of expenses under our services agreements and marketing expenses of $4.5 million. The share-based compensation expense for the year ended March 31, 2017 includes $1.6 million for RSL common share awards and RSL options issued to RSI and RSG employees.

General and administrative expenses decreased $10.8 million in the year ended March 31, 2017 as compared to the year ended March 31, 2016, primarily due to a decrease in share-based compensation of $24.6 million, partially offset

by an increase in personnel-related expenses of $4.2 million resulting from higher headcount and an increase in legal and professional fees of $3.0 million. In addition, expenses under our services agreements increased $2.5 million due to an increase in the general and administrative support services provided by RSI on our behalf and marketing expenses increased $1.9 million as a result of pre-commercial launch activities.

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General and administrative expenses were $56.5 million for the year ended March 31, 2016 and consisted primarily of share-based compensation of $41.8 million and employee salaries and related benefits, legal and professional fees, and direct and indirect costs allocated to us under the services agreement. The share-based compensation expense for the year ended March 31, 2016 includes $34.1 million for RSL common share awards and RSL options issued to RSI employees. These compensation amounts include share-based compensation expense for BVC awards issued to RSI employees prior to the BVC Merger. Prior to the BVC Merger we recorded share-based compensation expense in relation to the share-based awards issued by BVC to RSI employees based on the changes in fair value of share-based awards which were remeasured at each reporting period date until performance was completed as discussed above.

Interest Expense

Interest expense was $7.5 million and $1.1 million for the years ended March 31, 2018 and March 31, 2017, respectively, consisting of interest paid and the amortization of debt discount related to the Loan Agreement with Hercules.

There was no interest expense for the year ended March 31, 2016.

Liquidity and Capital Resources

Overview

As of March 31, 2018, we had cash totaling $154.3 million. In April 2017, we raised net proceeds of approximately $134.5 million, after deducting underwriting discounts and commissions and offering expenses, from the sale of 7,753,505 common shares in a follow-on public offering pursuant to a registration statement on Form S-3 that we filed with the SEC in December 2016. The registration statement permits for the offer and sale from time to time of up to $750.0 million of any combination of registered common shares, preferred shares, debt securities and warrants.

Roivant Financing

On June 5, 2018, we entered into the Purchase Agreement with RSL, our majority shareholder, pursuant to which we agreed to issue and sell to RSL 14,285,714 common shares at a purchase price of $1.75 per common share in the Private Placement, equal to the per share closing price of our common shares on the Nasdaq Global Select Market on June 5, 2018. The Purchase Agreement includes customary representations, warranties and covenants. Closing of the Private Placement is subject to satisfaction or waiver of customary closing conditions, including the lapse of a 20-day period following the mailing by us of an information statement relating to the Private Placement to our shareholders. The aggregate gross proceeds to us from the Private Placement are expected to be approximately $25.0 million.

Loan and Security Agreement with Hercules Capital, Inc.

On February 2, 2017, we and our wholly-owned subsidiaries, AHL, ASG, and ASI, entered into a loan and security agreement with Hercules Capital, Inc., or Hercules, as agent and lender. The loan and security agreement was amended on May 24 and September 22, 2017 and is referred to herein, as amended, as the Loan Agreement. Pursuant to the Loan Agreement, we, AHL and ASG, as the borrowers, borrowed an aggregate of $55.0 million, or the Term Loan, at the closing. ASI issued a guaranty of the borrowers' obligations under the Loan Agreement, and at the closing, we paid Hercules a facility charge of $550,000. On May 24, 2017, the Loan Agreement was amended such that the required minimum amount of unrestricted cash applied commencing on July 1, 2017 and is equal to the lesser of (i) the $35.0 million Applicable Amount plus certain aged accounts payable amounts (as further defined in the Loan Agreement) and (ii) the outstanding amount of debt under the Loan Agreement plus certain aged accounts payable (as further defined in the Loan Agreement), provided that the Applicable Amount may be lowered to $30 million upon the achievement of certain clinical milestones as set forth in the Loan Agreement.

The Term Loan bears interest at a variable per annum rate calculated for any day as the greater of either (i) the prime rate plus 6.80%, and (ii) 10.55%. The Term Loan has a scheduled maturity date of March 1, 2021. The borrowers are obligated to make monthly payments of accrued interest under the Loan Agreement until September 1, 2018, followed by monthly installments of principal and interest through March 1, 2021. The borrowers' obligations under the Loan Agreement are secured by a first position lien on substantially all of their and ASI's respective assets, other than intellectual property. If we prepay the loan prior to March 1, 2021, we will be obligated to pay Hercules a prepayment charge, based on a percentage of the then-outstanding principal balance, equal to 3.0% if the prepayment occurs within the first 18 months following February 2, 2017, 2.0% if the prepayment occurs after 18 months but prior to 36 months following February 2, 2017, and 1.0% if the prepayment occurs thereafter.

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The Loan Agreement includes customary affirmative and restrictive covenants and representations and warranties, including a minimum cash covenant, a covenant against the occurrence of a "change in control," financial reporting obligations, and certain limitations on the incurrence of indebtedness, liens (including a negative pledge on intellectual property and other assets), investments, distributions (including dividends), collateral, transfers, mergers or acquisitions, taxes, corporate changes, and deposit accounts. The Loan Agreement also includes customary events of default, including payment defaults, breaches of covenants following any applicable cure period, the occurrence of certain events that could reasonably be expected to have a "material adverse effect" as set forth in the Loan Agreement, cross acceleration to the debt and certain events relating to bankruptcy or insolvency. Upon the occurrence of an event of default, a default interest rate of an additional 5.0% may be applied to the outstanding principal balance, and Hercules may declare all outstanding obligations immediately due and payable and take such other actions as set forth in the Loan Agreement.

In connection with the Loan Agreement, we issued a warrant to Hercules which was exercisable for an aggregate of 274,086 of our common shares at an exercise price of $12.04 per share. In August 2017, Hercules exercised the warrant on a cashless basis and received a net issuance of 129,827 of our common shares.

For the year ended March 31, 2018, we used $190.3 million and $4.3 million of cash in our operating and investing activities, respectively. For the year ended March 31, 2017, we used $112.1 million and $0.1 million of cash in our operating and investing activities, respectively. We have incurred and expect to continue to incur significant and increasing operating losses at least for the next several years. We do not expect to generate revenue unless and until we successfully complete development and obtain regulatory approval for one of our products in development. Our cash utilization may fluctuate significantly from quarter-to-quarter and year-to-year, depending on the timing of our planned clinical trials and our expenditures on other research and development activities. We anticipate that we will continue to incur significant expenses as we:

- initiate clinical development of AXO-Lenti-PD for advanced Parkinson's disease, including our planned Phase 1/2 trial;
- continue the clinical development of nelotanserin for LBD and other indications;
- continue the clinical development of RVT-104, a combination of a peripheral muscarinic receptor antagonist and high-dose rivastigmine;
- wind down the MINDSET, HEADWAY and Gait and Balance trials for intepirdine;
- continue open-label extension studies for patients completing our nelotanserin phase 2 studies;
- seek to identify, acquire, develop and commercialize additional product candidates;
- integrate acquired technologies into a comprehensive regulatory and product development strategy;
- achieve milestones under our agreements with third parties that will require us to make substantial payments to those parties;
- maintain, expand and protect our intellectual property portfolio;
- hire and retain scientific, clinical, regulatory, manufacturing, quality control, commercial and administrative personnel;
- add operational, financial and management information systems and personnel, including personnel to support our drug development efforts;
- seek regulatory approvals for any product candidates that successfully complete clinical trials;
- scale up external manufacturing capabilities to commercialize our product candidates;
- establish a sales, marketing and distribution infrastructure for drug candidates for which we may obtain regulatory approval; and
- operate as a public company.

Our primary use of cash is to fund the research and development of our product candidates. We believe that our existing cash resources will be sufficient to enable us to fund our operating expenses and capital expenditure requirements for at least the next 12 months. We have based our estimates on assumptions that may prove to be incorrect, and we could use our available capital resources sooner than we currently expect. Our existing funds will

not be sufficient to enable us to complete all necessary development and to commercially launch all of our products. Accordingly, we will be required to obtain further funding through public or private equity offerings, debt financing, collaboration and licensing arrangements or other sources. Adequate additional funding may not be available to us on acceptable terms, or at all. If we are unable to raise capital in sufficient amounts or on terms acceptable to us, we may have to significantly delay, scale back or discontinue the development or commercialization of one or more of our products or potentially discontinue operations.

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Until such time, if ever, as we can generate substantial revenue from sales of our products in development, we expect to finance our cash needs through a combination of equity offerings, debt financings and potential collaboration, license or development agreements. We do not currently have any committed external source of funds other than our Loan Agreement with Hercules. To the extent that we raise additional capital through the sale of equity or convertible debt securities, our shareholders' ownership interests will be diluted, and the terms of these securities may include liquidation or other preferences that adversely affect our shareholders' rights. Debt financing and preferred equity financing, if available, may involve agreements that include covenants limiting or restricting our ability to take specific actions, such as incurring additional debt, making capital expenditures or declaring dividends. If we raise additional funds through collaborations, strategic alliances or marketing, distribution or licensing arrangements with third parties, we may be required to relinquish valuable rights to our technologies, future revenue streams, research programs or product candidates or to grant licenses on terms that may not be favorable to us. If we are unable to raise additional funds when needed, we may be required to delay, limit, reduce or terminate our drug development or future commercialization efforts or grant rights to develop and market product candidates that we would otherwise prefer to develop and market ourselves.

Cash Flows

The following table sets forth a summary of our cash flows for each of the periods shown (in thousands):

	Years Ended March 31,		
	2018	2017	2016
Net cash used in operating activities	$(190,348)	$(112,109)	$(53,347)
Net cash used in investing activities	(4,284)	(105)	(5,346)
Net cash provided by financing activities	136,396	48,536	334,944

Operating Activities

Cash flows from operating activities consist of net loss adjusted for non-cash items, including depreciation and share-based compensation expense, as well as the effect of changes in working capital and other activities.

For the year ended March 31, 2018, net cash used in operating activities was $190.3 million and was primarily attributable to a net loss of $221.6 million, partially offset by $31.9 million of non-cash share-based compensation expense.

For the year ended March 31, 2017, net cash used in operating activities was $112.1 million and was primarily attributable to a net loss of $181.0 million, partially offset by $36.4 million of non-cash share-based compensation expense and increases of $26.5 million in accrued expenses and $7.9 million in accounts payable.

For the year ended March 31, 2016, net cash used in operating activities was $53.3 million and was primarily attributable to a net loss of $133.1 million which includes costs incurred for research and development activities, including CRO fees, manufacturing, regulatory and other clinical trial costs and our general and administrative expenses, partially offset by $72.4 million of non-cash share-based compensation expense.

Investing Activities

For the year ended March 31, 2018, net cash used in investing activities was $4.3 million, consisting of purchases of leasehold improvements, furniture and equipment.

For the year ended March 31, 2017, net cash used in investing activities was $0.1 million, consisting of purchases of computer equipment.

For the year ended March 31, 2016, net cash used in investing activities was $5.3 million primarily for the payment made to RSL for nelotanserin.

Financing Activities

For the year ended March 31, 2018, net cash provided by financing activities was $136.4 million, primarily attributable to the net proceeds of $134.5 million received from the sale of 7,753,505 common shares in a follow-on public offering.

For the year ended March 31, 2017, net cash provided by financing activities was $48.5 million, primarily attributable to the net proceeds of $53.5 million from our debt financing from Hercules, offset by the deferred payment of $5.0 million made under the terms of the GSK Agreement in June 2016.

For the year ended March 31, 2016, net cash provided by financing activities was $334.9 million, which was primarily attributable to the net proceeds of $334.5 million from the IPO of our common shares.

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Off-Balance Sheet Arrangements

We did not have during the periods presented, and we do not currently have, any off-balance sheet arrangements, as defined under the SEC's rules. Accordingly, our operating results, financial condition and cash flows are not subject to off-balance sheet risks.

Contractual Obligations

Our long-term contractual obligations include commitments and estimated purchase obligations entered into in the normal course of business. We have entered into commitments under the Arena Development Agreement, the license agreement with Qaam, the services agreements with RSI and RSG and subleases with RSI and agreements with third parties for office space. In addition, we have entered into various services agreements with third parties for pharmaceutical manufacturing and research activities. The manufacturing agreements can be terminated by us with 30 days written notice. We expect to enter into other commitments as the business further develops.

During the year ended March 31, 2016, we entered into two subleases with RSI for office space in New York, NY. Under the terms of the subleases, RSI paid rent obligations directly pursuant to a master lease, and then invoiced us based on our proportionate share of the space and overhead expenses, calculated based upon the relative numbers of full-time equivalent employees located on the premises. As a result, our rent obligations under these subleases were not fixed. For the years ended March 31, 2018, 2017 and 2016, we incurred $0.9 million, $1.2 million and $0.6 million, respectively, in rent and shared office expense under this arrangement with RSI. In June 2017, we also entered into a license agreement for office space in New York, New York, under which we have remaining rent obligations of $0.9 million through January 2019. The Company ceased incurring rent expense under this arrangement with RSI after entering into the June 2017 license agreement for office space.

As of March 31, 2018, we did not have any ongoing material financial commitments, other than pursuant to the Arena Development Agreement, Loan Agreement and agreements to rent office space. As described in this report, we previously accrued $5.0 million as research and development expense for a contingent payment liability under the GSK Agreement. We paid this amount to GSK in June 2016.

The following table provides information with respect to contractual obligations as of March 31, 2018:

Contractual Obligations (in thousands)	Total	Under 1 year	1-3 years	3-5 years	Over 5 years
Long-term debt obligations	$55,000	$9,753	$45,247	$ —	$ —
Interest expense on long-term debt (1)	11,967	6,202	5,765	—	—
Rent obligations (2)	959	910	49	—	—
Total	$67,926	$16,865	$51,061	$ —	$ —

(1) estimated using interest rate in effect at March 31, 2018

(2) net of prepayments

Recent Accounting Pronouncements

For detailed information regarding recently issued accounting pronouncements and the expected impact on our financial statements, refer to Note 2 "Summary of Significant Accounting Policies," in the accompanying notes to our audited consolidated financial statements included elsewhere in this Annual Report on Form 10-K.

Application of Critical Accounting Policies and Significant Judgments and Estimates

Our management's discussion and analysis of our financial condition and results of operations is based on our consolidated financial statements, which have been prepared in accordance with U.S. generally accepted accounting principles, or GAAP. The preparation of these consolidated financial statements requires us to make estimates, judgments and assumptions that affect the reported amounts of assets and liabilities, disclosure of contingent assets and liabilities as of the dates of the balance sheets and the reported amounts of expenses during the reporting periods. In accordance with U.S. GAAP, we evaluate our estimates and judgments on an ongoing basis. Significant

estimates include assumptions used in the determination of some of our costs incurred under our services agreements with RSG and RSI, which costs are charged to research and development and general and administrative expense, as well as assumptions used to estimate the fair value of our common shares and stock awards. We base our estimates on historical experience and on various other factors that we believe are reasonable under the circumstances, the results of which form the basis for making judgments about the carrying value of assets and liabilities that are not readily apparent from other sources. Actual results may differ from these estimates under different assumptions or conditions.

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We define our critical accounting policies as those under U.S. GAAP that require us to make subjective estimates and judgments about matters that are uncertain and are likely to have a material impact on our financial condition and results of operations, as well as the specific manner in which we apply those principles.

Our significant accounting policies are more fully described in Note 2 to our audited consolidated financial statements included elsewhere in this Annual Report on Form 10-K. Not all of these significant accounting policies, however, require that we make estimates and assumptions that we believe are "critical accounting estimates." We have discussed our accounting policies with the audit committee of our board of directors, and we believe that our estimates relating to contingent payment liabilities, share-based compensation, research and development accruals and income taxes described below have the greatest potential impact on our consolidated financial statements, and are "critical accounting estimates."

Contingent Payment Liability

One significant estimate relates to the probability and timing of contingent payment liabilities recorded in the balance sheet. We paid $5.0 million in June 2016 related to the GSK Agreement. Had the specified criteria for payment not been met, or been met in a period different from our expectation, there could have been significant fluctuation in our financial results in future periods.

Share-Based Compensation

We recognize share-based compensation expense related to stock options granted based on the estimated fair value of the awards on the date of grant. We estimate the grant date fair value, and the resulting share-based compensation expense, using the Black-Scholes option-pricing model. The grant date fair value of the share-based awards is generally recognized on a straight-line basis over the requisite service period, which is generally the vesting period of the respective awards, however, the fair value of the stock options granted to non-employees is remeasured each reporting period until the service is complete, and the resulting increase or decrease in value, if any, is recognized as expense or income, respectively, during the period the related services are rendered.

The Black-Scholes option-pricing model requires the use of highly subjective assumptions, which are used to determine the fair value of share-based awards. These assumptions include:

Expected Term. The expected term represents the period that our share-based awards are expected to be outstanding and is determined using the simplified method (based on the mid-point between the vesting date and the end of the contractual term).

Expected Volatility. Because we do not have an extended trading history for our common shares, the expected volatility is estimated using weighted average measures of implied volatility and the historical volatility of our peer group of companies for a period equal to the expected life of the stock options. Our peer group of publicly traded biopharmaceutical companies was chosen based on their similar size, stage in the life cycle or area of specialty.

Risk-Free Interest Rate. The risk-free interest rate is based on the interest rates paid on securities issued by the U.S. Treasury with a term approximating the expected life of the stock options.

Expected Dividend. We have never paid, and do not anticipate paying, cash dividends on our common shares. Therefore, the expected dividend yield was assumed to be zero.

A significant component of total share-based compensation expense relates to the RSL common share awards and RSL options issued by RSL to RSL, RSG and RSI employees. For the years ended March 31, 2018, 2017 and 2016, we recorded share-based compensation expense of $5.4 million, $10.9 million and $53.4 million, respectively, in relation to the RSL common share awards and RSL stock options issued by RSL to RSL, RSG and RSI employees. These share-based compensation amounts include compensation expense for BVC awards prior to the BVC Merger on December 4, 2015. Share-based compensation expense is allocated to us by RSL based upon the relative percentage of time utilized by RSL, RSG and RSI employees on our matters. Prior to the BVC Merger, we recorded share-based compensation expense, in relation to the share-based awards issued by BVC to RSI employees based on the changes in fair value of BVC share-based awards. As these BVC share-based awards were not based on our or RSL's shares, they were remeasured at each reporting period date until performance was completed. As a result of the BVC Merger, all outstanding BVC share-based awards were converted into RSL common share awards, with the same vesting and forfeiture terms as the original grant. The RSL common share awards and RSL options are fair valued on the date of grant and that fair value is recognized over the requisite service period. At the time of the BVC Merger on December

4, 2015, the unvested BVC awards that were converted into common shares of RSL were remeasured at the estimated fair value of RSL and that fair value is recognized over the remaining requisite service period. On December 8, 2015 following the BVC Merger, RSL had a recapitalization in conjunction with a private financing.

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The RSL common share awards are valued at fair value on the date of grant and that fair value is recognized over the requisite service period. As a result of the BVC Merger, the converted BVC awards will not be remeasured prospectively. The estimated fair value of these RSL common share awards was determined by the valuation of the December 8, 2015 RSL private financing. Prior to the BVC Merger, the fair value of BVC awards was based on RSL's valuation after considering the fair value of RSL's ownership interest in us and RSL's other investments, discounted cash flow analysis, transactions entered into and contemplated by RSL and relevant industry and comparable public company data. As RSL is a non-public entity, therefore the BVC awards prior to the BVC Merger and the RSL common share awards following the BVC Merger are classified as Level 3 due to their unobservable nature. Significant judgment and estimates were used to estimate the fair value of these awards and options, as they are not publicly traded. RSL common share awards and RSL options are subject to specified vesting schedules and requirements (a mix of time-based and performance-based events). The fair value is based on various corporate event-based considerations, including targets for RSL's post-IPO market capitalization and future financing events. The fair value of each RSL option is estimated on the date of grant using the Black-Scholes closed-form option-pricing model.

Research and Development Expense

Research and development costs are expensed as incurred. Clinical study costs are accrued over the service periods specified in the contracts and adjusted as necessary based upon an ongoing review of the level of effort and costs actually incurred. Payments for a product license prior to regulatory approval of the product and payments for milestones achieved prior to regulatory approval of the product are expensed in the period incurred as research and development. Milestone payments made in connection with regulatory approvals are capitalized and amortized to cost of revenue over the remaining useful life of the asset. Research and development costs are charged to expense when incurred and primarily consist of the intellectual property and research and development materials acquired from GSK and Arena, certain costs charged by RSI and RSG under their services agreements with us, ASI and ASG and expenses from third parties who conduct research and development activities on our behalf. We expense in-process research and development projects acquired as asset acquisitions which have not reached technological feasibility and which have no alternative future use.

Income Taxes

Deferred tax assets and liabilities are recognized for the future tax consequences attributable to differences between the financial statement carrying amounts of existing assets and liabilities and the 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 recovered or settled. The effect on deferred tax assets and liabilities of a change in tax rates is recognized in income in the period that includes the enactment date. A valuation allowance is recorded when, after consideration of all positive and negative evidence, it is not more likely than not that our deferred tax assets will be realizable. When uncertain tax positions exist, we recognize the tax benefit of tax positions to the extent that the benefit will more likely than not be realized. The determination as to whether the tax benefit will more likely than not be realized is based upon the technical merits of the tax position as well as consideration of the available facts and circumstances. When and if we were to recognize interest and penalties related to unrecognized tax benefits, they would be reported in tax expense in the consolidated statements of operations.

Item 7A. Quantitative and Qualitative Disclosures About Market Risk

Market risk is the potential loss arising from adverse changes in market rates and market prices such as interest rates, foreign currency exchange rates, and changes in the market value of equity instruments. As of March 31, 2018, we had cash of $154.3 million, consisting of non-interest bearing deposits denominated in the U.S. dollar and Swiss franc and, as a result, a sudden change in interest rates would not be expected to have a material impact on our financial condition or results of operations.

We also have long-term debt that bears interest at a prime-based variable rate. A 10% change in this interest rate would have an impact of approximately $0.6 million on our annual interest expense. We do not believe we are currently exposed to any material market risk.

Item 8. Financial Statements and Supplementary Data

All financial statements and schedules required to be filed hereunder are listed in the Index to Financial Statements and set forth in Item 15 of this Annual Report on Form 10-K, and are incorporated herein by reference.

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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

Under the supervision of our principal executive officer and principal financial officer, we evaluated the effectiveness of our disclosure controls and procedures as of March 31, 2018, the end of the period covered by this report. The term "disclosure controls and procedures" (as defined in Rules 13a-15(e) and 15d-15(e) under the Securities Exchange Act of 1934, as amended, or the Exchange Act), means controls and other procedures of a company that are designed to provide reasonable assurance that information required to be disclosed by us in the reports that we file or submit under the Exchange Act is recorded, processed, summarized and reported within the time periods specified in the SEC's rules and forms.

Disclosure controls and procedures include, without limitation, controls and procedures designed to provide reasonable assurance that information required to be disclosed by us in the reports that we file or submit under the Exchange Act 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. Based on this evaluation, our principal executive officer and principal financial officer concluded that our disclosure controls and procedures were effective as of March 31, 2018 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 (as defined in Rules 13a-15(f) and 15d-15(f) under the Exchange Act). Our management conducted an evaluation of the effectiveness of our internal control over financial reporting as of March 31, 2018, based on the criteria established in Internal Control - Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission.

Based on the results of its evaluation, management concluded that our internal control over financial reporting was effective as of March 31, 2018.

Inherent Limitations on Effectiveness of Controls

Our management, including our principal executive officer and principal financial officer, does not expect that our disclosure controls and procedures or our internal controls will prevent all error and all fraud. A control system, no matter how well conceived and operated, can provide only reasonable, not absolute, assurance that the objectives of the control system are met. Further, the design of a control system must reflect the fact that there are resource constraints, and the benefits of controls must be considered relative to their costs. Because of the inherent limitations in all control systems, no evaluation of controls can provide absolute assurance that all control issues and instances of fraud, if any, within Axovant Sciences Ltd. have been detected.

Attestation Report of the Registered Public Accounting Firm

This Annual Report on Form 10-K does not include an attestation report of our registered public accounting firm due to an exemption established by the JOBS Act for "emerging growth companies."

Changes in Internal Control over Financial Reporting

No changes in our internal control over financial reporting (as defined in Rules 13a-15(f) and 15d-15(f) under the Exchange Act) occurred during the fiscal quarter ended March 31, 2018 that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

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Item 9B. Other Information

On June 10, 2018, Michael Adasczik, our Principal Accounting Officer, advised us that following the filing of this Annual Report on Form 10-K for the year ended March 31, 2018, he would immediately transition his responsibilities to Gregory Weinhoff, our Principal Financial Officer. Mr. Weinhoff will assume the additional title and responsibilities of Principal Accounting Officer.

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PART III.

We will file a definitive proxy statement for our 2018 annual meeting of shareholders (the "2018 Proxy Statement") with the SEC, pursuant to Regulation 14A, not later than 120 days after the end of our fiscal year. Accordingly, certain information required by Part III has been omitted under General Instruction G(3) to Form 10-K. Only those sections of the 2018 Proxy Statement that specifically address the items set forth herein are incorporated by reference.

Item 10. Directors, Executive Officers and Corporate Governance

The information required by this item will be contained in our 2018 Proxy Statement under the captions "Discussion of Proposals," "Information About Corporate Governance," "Information About Our Executive Officers" and "Section 16(a) Beneficial Ownership Reporting Compliance" and is incorporated herein by reference.

Item 11. Executive Compensation

The information required by this item will be contained in our 2018 Proxy Statement under the captions "Information About Corporate Governance" and "Executive Compensation" and is incorporated herein by reference.

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

The information required by this item will be contained in our 2018 Proxy Statement under the captions "Principal Shareholders, "Information About Our Executive Officers" 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 2018 Proxy Statement under the caption "Certain Relationships and Related Party Transactions" and is incorporated herein by reference.

Item 14. Principal Accounting Fees and Services

The information required by this item will be contained in our 2018 Proxy Statement under the captions "Independent Registered Public Accounting Firm Fees and Other Matters" and "Discussion of Proposals" and is incorporated herein by reference.

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PART IV. FINANCIAL INFORMATION

Item 15. Exhibits and Financial Statements Schedules

(a) Documents filed as part of this Annual Report on Form 10-K:
(1) Financial Statements. The Consolidated Financial Statements are included as Appendix A hereto and are filed as part of this Annual Report on Form 10-K. The Consolidated Financial Statements include:

(2) Exhibits. The exhibits set forth below on the Exhibit Index to this annual report are filed as part of this Annual Report on Form 10-K. This list of exhibits identifies each management contract or compensatory plan or arrangement required to be filed as an exhibit to this Annual Report on Form 10-K.

Index to Exhibits

Exhibit Number	Description of Document
2.1*	Asset Purchase Agreement, by and among the Registrant and Glaxo Group Limited and GlaxoSmithKline Intellectual Property Development Limited, dated as of December 17, 2014, incorporated herein by reference to Exhibit 2.1 of the Registrant's Registration Statement on Form S-1 (File No. 333-204073), filed on May 11, 2015.
3.1	Certificate of Incorporation as currently in effect, incorporated herein by reference to Exhibit 3.1 of the Registrant's Registration Statement on Form S-1 (File No. 333-204073), filed on May 11, 2015.
3.2	Memorandum of Association, as currently in effect, incorporated herein by reference to Exhibit 3.2 of the Registrant's Registration Statement on Form S-1 (File No. 333-204073), filed on May 11, 2015.
3.3	Second Amended and Restated Bye-laws, as currently in effect, incorporated herein by reference to Exhibit 3.1 of the Registrant’s Current Report on Form 8-K (File No. 001-37418), filed on December 21, 2017
10.1	Amended and Restated Services Agreement, effective as of December 13, 2016, by and among Roivant Sciences, Inc., Axovant Sciences GmbH, Axovant Sciences, Inc. and the Registrant, incorporated herein by reference to Exhibit 10.1 of the Registrant’s Quarterly Report on Form 10-Q (File No. 001-37418), filed on February 14, 2017.
10.2	Information Sharing and Cooperation Agreement, dated as of March 18, 2015, by and between Roivant Sciences Ltd. and the Registrant, incorporated herein by reference to Exhibit 10.7 of the Registrant's Registration Statement on Form S-1 (File No. 333-204073), filed on May 11, 2015.

10.3*	Development, Marketing and Supply Agreement, dated May 8, 2015, between Roivant Sciences Ltd. and Arena Pharmaceuticals GmbH, incorporated herein by reference to Exhibit 10.2 of the Registrant's Quarterly Report on Form 10-Q (File No. 001-37418), filed on February 09, 2016.

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10.4	Waiver and Option Agreement, dated as of May 8, 2015, by and between Roivant Sciences Ltd. and the Registrant, incorporated herein by reference to Exhibit 10.9 of the Registrant's Amendment No.1 to Registration Statement on Form S-1/A (File No. 333-204073), filed on May 22, 2015.
10.5+	2015 Equity Incentive Plan, as amended, incorporated herein by reference to Exhibit 10.1 of the Registrant's Amendment No.1 to Registration Statement on Form S-1/A (File No. 333-204073), filed on May 22, 2015.
10.6+	Forms of Option Grant Notice and Option Agreement under 2015 Equity Incentive Plan, as amended, incorporated herein by reference to Exhibit 10.2 of the Registrant's Amendment No.1 to Registration Statement on Form S-1/A (File No. 333-204073), filed on May 22, 2015.
10.7+	Form of Early Exercise Stock Purchase Agreement under 2015 Equity Incentive Plan as amended, incorporated herein by reference to Exhibit 10.3 of the Registrant's Amendment No.1 to Registration Statement on Form S-1/A (File No. 333-204073), filed on May 22, 2015.
10.8+	Form of Executive Officer Employment Agreement with Axovant Sciences, Inc, incorporated herein by reference to Exhibit 10.7 of the Registrant's Amendment No.1 to Registration Statement on Form S-1/A (File No. 333-204073), filed on May 22, 2015.
10.9+	Employment Offer Letter, dated as of April 25, 2015, by and between Lawrence Friedhoff and Axovant Sciences, Inc., incorporated herein by reference to Exhibit 10.8 of the Registrant's Amendment No.1 to Registration Statement on Form S-1/A (File No. 333-204073), filed on May 22, 2015.
10.10+	Employment Offer Letter, dated as of March 23, 2015, by and between Marianne Romeo Dinsmore and the Registrant, incorporated herein by reference to Exhibit 10.9 of the Registrant's Amendment No.2 to Registration Statement on Form S-1/A (File No. 333-204073), filed on June 01, 2015.
10.11+	Form of Indemnification Agreement with directors and executive officers, incorporated herein by reference to Exhibit 10.4 of the Registrant's Amendment No.1 to Registration Statement on Form S-1/A (File No. 333-204073), filed on May 22, 2015.
10.12+	Non-Employee Director Compensation Policy., incorporated herein by reference to Exhibit 10.12 of the Registrant’s Annual Report on Form 10-K (File No. 001-37418), filed on June 13, 2017.
10.13	Loan and Security Agreement, dated February 2, 2017, by and among the Registrant, Axovant Holdings Limited, Axovant Sciences GmbH, Axovant Sciences, Inc. and Hercules Capital, Inc., incorporated herein by reference to Exhibit 10.13 of the Registrant’s Annual Report on Form 10-K (File No. 001-37418), filed on June 13, 2017.
10.14	Warrant Agreement, dated February 2, 2017, issued to Hercules Capital, Inc., incorporated herein by reference to Exhibit 4.1 of the Registrant’s Current Report on Form 8-K (File No. 001-37418), filed on February 3, 2017.
10.15	First Amendment to Loan and Security Agreement, dated May 24, 2017, by and among the Registrant, Axovant Holdings Limited, Axovant Sciences GmbH, Axovant Sciences, Inc. and Hercules Capital, Inc., incorporated herein by reference to Exhibit 10.15 of the Registrant’s Annual Report on Form 10-K (File No. 001-37418), filed on June 13, 2017.
10.16	

	Second Amendment to Loan and Security Agreement, dated September 22, 2017, by and among the Registrant, Axovant Holdings Limited, Axovant Sciences GmbH, Axovant Sciences, Inc., Axovant Sciences America, Inc. and Hercules Capital, Inc., incorporated herein by reference to Exhibit 10.1 of the Registrant's Quarterly Report on Form 10-Q (File No. 001-37418), filed on November 2, 2017.
10.17	Letter Agreement, dated October 18, 2017, re: Non-Commercial Manufacturing Provisions of the Development, Marketing and Supply Agreement, dated May 8, 2015, by and between Arena Pharmaceuticals GmbH and Axovant Sciences GmbH (as successor in interest to Axovant Sciences Ltd. and Roivant Sciences Ltd.), incorporated herein by reference to Exhibit 10.2 of the Registrant's Quarterly Report on Form 10-Q (File No. 001-37418), filed on November 2, 2017.
10.18	Services Agreement, effective as of December 31, 2016, by and among Roivant Sciences GmbH and Axovant Sciences GmbH, incorporated herein by reference to Exhibit 10.2 of the Registrant's Quarterly Report on Form 10-Q (File No. 001-37418), filed on February 14, 2017.
10.19+	Employment Agreement, dated April 7, 2017, by and between David Hung and Axovant Sciences, Inc., incorporated herein by reference to Exhibit 10.1 of the Registrant's Current Report on Form 8-K (File No. 001-37418), filed on April 10, 2017.
10.20+	Employment Agreement, dated April 7, 2017, by and between Marion McCourt and Axovant Sciences, Inc., incorporated herein by reference to Exhibit 10.2 of the Registrant's Current Report on Form 8-K (File No. 001-37418), filed on April 10, 2017.

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10.21†+	Separation Agreement, dated February 7, 2018, by and between Marion McCourt and Axovant Sciences, Inc.
10.22†+	Separation Agreement, dated February 11, 2018, by and between David Hung and Axovant Sciences, Inc.
10.23†+	Mutual Release Agreement, dated February 11, 2018, by and between David Hung and Axovant Sciences, Inc.
10.24†+	Employment Agreement, dated February 13, 2018, by and between Pavan Cheruvu and Axovant Sciences, Inc.
21.1†	Subsidiaries of the Registrant.
23.1†	Consent of Ernst & Young LLP, independent registered public accounting firm.
23.2†	Consent of PricewaterhouseCoopers LLP, independent registered public accounting firm.
24.1†	Power of Attorney (included on signature page).
31.1†	Certification of Principal Executive Officer pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.
31.2†	Certification of Principal Financial Officer pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.
32.1**	Certification of Principal Executive Officer pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.
32.2**	Certification of Principal Financial Officer pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.
101.INS XBRL	Instance Document
101.SCH XBRL	Taxonomy Extension Schema
101.CAL XBRL	Taxonomy Extension Calculation Linkbase
101.DEF XBRL	Taxonomy Extension Definition Linkbase
101.LAB XBRL	Taxonomy Extension Label Linkbase
101.PRE XBRL	Taxonomy Extension Presentation Linkbase

† Filed herewith.
+Indicates management contract or compensatory plan.

*Confidential treatment has been granted for portions omitted from this exhibit (indicated by asterisks) and those portions have been separately filed with the Securities and Exchange Commission.

** In accordance with Item 601(b)(32)(ii) of Regulation S-K and SEC Release Nos. 33-8238 and 34-47986, Final Rule: Management's Reports on Internal Control Over Financial Reporting and Certification of Disclosure in Exchange Act Periodic Reports, these certifications are being furnished solely to accompany this Annual Report on Form 10-K pursuant to 18 U.S.C. Section 1350, and are not being filed for purposes of Section 18 of the Securities Exchange Act of 1934, as amended, and are not to be incorporated by reference into any filing of the Registrant, whether made before or after the date hereof, regardless of any general incorporation language in such filing.

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SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

AXOVANT SCIENCES LTD.

By: /s/ Pavan Cheruvu
Pavan Cheruvu
Principal Executive Officer

June 11, 2018

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KNOW ALL PERSONS BY THESE PRESENTS, that each person whose signature appears below constitutes and appoints Pavan Cheruvu and Gregory Weinhoff, jointly and severally, as his true and lawful attorneys-in-fact and agents, with full power of substitution and resubstitution, for him or her and in his name, place and stead, in any and all capacities, to sign this Annual Report on Form 10-K of Axovant Sciences Ltd., and any or all amendments (including post-effective amendments) thereto, and to file the same, with all exhibits thereto, and other documents in connection therewith, with the Securities and Exchange Commission, granting unto said attorneys-in-fact and agents full power and authority to do and perform each and every act and thing requisite or necessary to be done in and about the premises hereby ratifying and confirming all that said attorneys-in-fact and agents, or his, her or their substitute or substitutes, may lawfully do or cause to be done by virtue hereof.

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

Signature	Title	Date
/s/ Pavan Cheruvu Pavan Cheruvu	Principal Executive Officer	June 11, 2018
/s/ Gregory Weinhoff Gregory Weinhoff	Principal Financial Officer	June 11, 2018
/s/ Michael Adasczik Michael Adasczik	Principal Accounting Officer	June 11, 2018
/s/ Vivek Ramaswamy Vivek Ramaswamy	Director	June 11, 2018
/s/ Berndt Modig Berndt Modig	Director	June 11, 2018
/s/ Atul Pande Atul Pande	Director	June 11, 2018
/s/ Roger Jeffs Roger Jeffs	Director	June 11, 2018
/s/ George Bickerstaff George Bickerstaff	Director	June 11, 2018
/s/ Ilan Oren Ilan Oren	Director	June 11, 2018

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INDEX TO THE CONSOLIDATED FINANCIAL STATEMENTS OF AXOVANT SCIENCES LTD.

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Report of Independent Registered Public Accounting Firm
To the Shareholders and the Board of Directors of Axovant Sciences Ltd.
Opinion on the Financial Statements
We have audited the accompanying consolidated balance sheets of Axovant Sciences Ltd. (the Company) as of March 31, 2018 and 2017, the related consolidated statements of operations, comprehensive loss, shareholders' equity (deficit) and cash flows for each of the two years in the period ended March 31, 2018, and the related notes (collectively referred to as the "consolidated financial statements"). In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of the Company at March 31, 2018 and 2017, and the results of its operations and its cash flows for each of the two years in the period ended March 31, 2018, in conformity with U.S. generally accepted accounting principles.
Basis for Opinion
These financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on the Company's financial statements based on our audits. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) (PCAOB) and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.
We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement, whether due to error or fraud. The Company is not required to have, nor were we engaged to perform, an audit of its internal control over financial reporting. As part of our audits we are required to obtain an understanding of internal control over financial reporting but not for the purpose of expressing an opinion on the effectiveness of the Company's internal control over financial reporting. Accordingly, we express no such opinion.
Our audits included performing procedures to assess the risks of material misstatement of the financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the financial statements. We believe that our audits provide a reasonable basis for our opinion.

/s/ Ernst & Young LLP

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

Iselin, New Jersey
June 11, 2018

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Report of Independent Registered Public Accounting Firm

To the Board of Directors and Shareholders of Axovant Sciences Ltd.:

In our opinion, the consolidated statements of operations, of comprehensive loss, and shareholders' equity (deficit) for the year ended March 31, 2016 present fairly, in all material respects, the results of operations and cash flows of Axovant Sciences Ltd. and its subsidiaries for the year ended March 31, 2016, in conformity with accounting principles generally accepted in the United States of America. 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 audit. We conducted our audit of these financial statements 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. 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 audit provides a reasonable basis for our opinion.

/s/ PricewaterhouseCoopers LLP

Florham Park, New Jersey
June 6, 2016

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AXOVANT SCIENCES LTD.
Consolidated Balance Sheets
(in thousands, except share and per share data)

	March 31, 2018	March 31, 2017
Assets		
Current assets:		
Cash	$154,337	$212,573
Prepaid expenses and other current assets	2,174	6,457
Income tax receivable	1,751	658
Total current assets	158,262	219,688
Property and equipment, net	2,524	142
Deferred tax assets	—	2,709
Total assets	$160,786	$222,539
Liabilities and Shareholders' Equity		
Current liabilities:		
Accounts payable	$3,949	$8,551
Due to Roivant Sciences Ltd., Roivant Sciences, Inc. and Roivant Sciences GmbH	1,011	2,919
Accrued expenses	31,862	34,796
Current portion of long term debt	9,753	—
Total current liabilities	46,575	46,266
Long term debt	42,925	51,436
Total liabilities	89,500	97,702
Commitments and contingencies (Note 10)		
Shareholders' equity:		
Common shares, par value $0.00001 per share, 1,000,000,000 shares authorized, 107,788,074 and 99,163,919 issued and outstanding at March 31, 2018 and March 31, 2017, respectively	1	1
Accumulated other comprehensive income	126	378
Additional paid-in capital	628,110	459,601
Accumulated deficit	(556,951)	(335,143)
Total shareholders' equity	71,286	124,837
Total liabilities and shareholders' equity	$160,786	$222,539

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

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AXOVANT SCIENCES LTD.
Consolidated Statements of Operations
(in thousands, except share and per share amounts)

	Years Ended March 31,		
	2018	2017	2016
Operating expenses:			
Research and development expenses (includes $16,597, $19,186 and $30,622 of share-based compensation expense for the years ended March 31, 2018, 2017 and 2016, respectively)	$141,412	$134,778	$76,644
General and administrative expenses (includes $15,281, $17,184 and $41,764 of share-based compensation expense for the years ended March 31, 2018, 2017 and 2016, respectively)	71,906	45,721	56,518
Total operating expenses	213,318	180,499	133,162
Interest expense	7,545	1,143	—
Other (income) expense	(211)	369	—
Loss before income tax expense (benefit)	(220,652)	(182,011)	(133,162)
Income tax expense (benefit)	921	(1,060)	(17)
Net loss	$(221,573)	$(180,951)	$(133,145)
Net loss per common share — basic and diluted	$(2.06)	$(1.82)	$(1.41)
Weighted average common shares outstanding — basic and diluted	107,375,927	99,158,699	94,465,164

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

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AXOVANT SCIENCES LTD.
Consolidated Statements of Comprehensive Loss
(in thousands)

	Years Ended March 31,		
	2018	2017	2016
Net loss	$(221,573)	$(180,951)	$(133,145)
Other comprehensive (loss) income:			
Foreign currency translation adjustment	(252)	378	—
Total other comprehensive (loss) income	(252)	378	—
Comprehensive loss	$(221,825)	$(180,573)	$(133,145)

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

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AXOVANT SCIENCES LTD.
Consolidated Statements of Shareholders' Equity (Deficit)
(in thousands, except share and per share data)

	Common Shares		Common Shares Subscribed	Additional Paid in Capital	Accumulated Deficit	Accumulated Other Comprehensive Income (Loss)	Total Shareholders' Equity (Deficit)
	Shares	Amount					
Balance at March 31, 2015	75,000,000	$ 1	$ (1)	$ 13,296	$ (21,047)	$ —	$ (7,751)
Sale of common shares in initial public offering ($15.00 per share), net of underwriting discounts and commissions and offering expenses of $27,748	24,150,000	—	—	334,502	—	—	334,502
Common shares subscription paid	—	—	1	—	—	—	1
Capital contribution	—	—	—	750	—	—	750
Share-based compensation expense	—	—	—	17,994	—	—	17,994
Capital contribution — share-based compensation	—	—	—	54,392	—	—	54,392
Net loss	—	—	—	—	(133,145)	—	(133,145)
Balance at March 31, 2016	99,150,000	$ 1	$ —	$ 420,934	$ (154,192)	$ —	$ 266,743
Exercise of stock options	13,919	—	—	36	—	—	36
Warrant issued with debt financing	—	—	—	2,261	—	—	2,261
Share-based compensation expense	—	—	—	25,449	—	—	25,449
Capital contribution — share-based compensation	—	—	—	10,921	—	—	10,921
Foreign currency translation adjustment	—	—	—	—	—	378	378
Net loss	—	—	—	—	(180,951)	—	(180,951)
Balance at March 31, 2017	99,163,919	$ 1	$ —	$ 459,601	$ (335,143)	$ 378	$ 124,837
Adjustment to adopt ASU 2016-09	—	—	—	235	(235)	—	—
Exercise of stock options	740,823	—	—	1,557	—	—	1,557
Exercise of warrant	129,827	—	—	—	—	—	—
Stock issued for equity financing, net of underwriting discounts and commissions and offering expenses of $9.2 million	7,753,505	—	—	134,515	—	—	134,515
Capital contribution	—	—	—	324	—	—	324
Share-based compensation expense	—	—	—	26,465	—	—	26,465
Capital contribution — share-based compensation	—	—	—	5,413	—	—	5,413
Foreign currency translation adjustment	—	—	—	—	—	(252)	(252)
Net loss	—	—	—	—	(221,573)	—	(221,573)
Balance at March 31, 2018	107,788,074	$ 1	$ —	$ 628,110	$ (556,951)	$ 126	$ 71,286

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

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AXOVANT SCIENCES LTD.
Consolidated Statements of Cash Flows
(in thousands)

	Years Ended March 31,		
	2018	2017	2016
Cash flows from operating activities:			
Net loss	$(221,573)	$(180,951)	$(133,145)
Adjustments to reconcile net loss to net cash used in operating activities:			
In-process research and development expenses	—	—	5,252
Disposal of fixed assets	24	—	—
Foreign currency translation adjustment	(252)	378	—
Share-based compensation	31,878	36,370	72,386
Depreciation and amortization	3,083	249	14
Deferred tax assets	2,709	(2,386)	(323)
Changes in operating assets and liabilities:			
Prepaid expenses and other current assets	4,283	(1,592)	(4,860)
Income tax receivable	(1,093)	312	(1,155)
Accounts payable	(4,602)	7,929	219
Due to Roivant Sciences Ltd., Roivant Sciences, Inc. and Roivant Sciences GmbH	(1,871)	1,105	(311)
Accrued expenses	(2,934)	26,477	8,391
Income tax payable	—	—	185
Net cash used in operating activities	(190,348)	(112,109)	(53,347)
Cash flows from investing activities:			
Purchase of in-process research and development	—	—	(5,252)
Purchases of property and equipment	(4,284)	(105)	(94)
Net cash used in investing activities	(4,284)	(105)	(5,346)
Cash flows from financing activities:			
Cash proceeds from issuance of common shares in initial public offering, net of underwriting discount	—	—	336,893
Initial public offering costs paid	—	—	(2,351)
Capital contribution from Roivant Sciences Ltd.	324	—	751
Repayment of amounts due to Roivant Sciences Ltd. and Roivant Sciences, Inc. for amounts paid on behalf of the Company	—	—	(627)
Due to Roivant Sciences Ltd. and Roivant Sciences, Inc. for amounts paid on behalf of the Company	—	—	278
Payment of contingent liability	—	(5,000)	—
Exercise of stock options	1,557	36	—
Cash proceeds from debt financing, net of financing costs	—	53,500	—
Cash proceeds from issuance of common shares, net of costs	134,515	—	—
Net cash provided by financing activities	136,396	48,536	334,944
Net change in cash	(58,236)	(63,678)	276,251
Cash—beginning of year	212,573	276,251	—
Cash—end of year	$154,337	$212,573	$276,251
Non-cash financing activities:			
Recognition of warrant issued in debt financing	$—	$2,261	$—

Issuance of common stock upon issuance of warrant	$2,594	$—	$—
Supplemental disclosure of cash paid:			
Income taxes	$377	$1,014	$1,279
Interest	$6,365	$435	$—

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

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AXOVANT SCIENCES LTD.
Notes to Consolidated Financial Statements
Note 1—Description of Business

Axovant Sciences Ltd., inclusive of its wholly-owned subsidiaries (the ‘‘Company’’), is a clinical-stage biopharmaceutical company focused on the acquisition, development and commercialization of novel therapeutics in the fields of neurology and psychiatry. The Company is developing a pipeline of clinical and nonclinical product candidates that focuses on the various aspects of debilitating neurodegenerative diseases such as Parkinson’s disease, Alzheimer's disease, Lewy body dementia and other indications in the fields of neurology and psychiatry. The Company’s goal is to be the leading biopharmaceutical company focused on the fields of neurology and psychiatry.

The Company was founded on October 31, 2014 as a Bermuda Exempted Limited Company and a wholly-owned subsidiary of Roivant Sciences Ltd. (‘‘RSL’’), under the name Roivant Neurosciences Ltd. The Company changed its name to Axovant Sciences Ltd. in March 2015. On February 24, 2015, Axovant Sciences, Inc. (“ASI”) was formed, and on March 7, 2015 it became a wholly-owned subsidiary of the Company based in the United States of America.

In August 2016, the Company incorporated as its wholly-owned subsidiaries Axovant Holdings Limited ("AHL"), a private limited company incorporated under the laws of England and Wales, and Axovant Sciences GmbH ("ASG"), a company with limited liability formed under the laws of Switzerland. ASG holds the Company's intellectual property rights and will be the principal operating company for conducting its business. In July 2017, Axovant Sciences America, Inc. (“ASA”) was incorporated in Delaware and became a wholly-owned subsidiary of the Company. In March 2018, Axovant Treasury Holdings, Inc. was incorporated in Delaware and became a wholly-owned subsidiary of the Company and Axovant Treasury, Inc. was incorporated in Delaware and became a wholly-owned subsidiary of Axovant Treasury Holdings, Inc.

From its inception, the Company has devoted substantially all of its efforts to organizing and staffing the Company, raising capital, acquiring product candidates and advancing its product candidates, intepirdine, previously referred to as RVT-101, and nelotanserin, into clinical development for patients with Alzheimer's disease or Lewy body dementia. In light of the data from recent trials, we have discontinued any further development of intepirdine, continued our clinical development of nelotanserin and pursued development of a pipeline of clinical and nonclinical product candidates.

In June 2018, ASG entered into a license agreement (the “Oxford BioMedica Agreement”) with Oxford BioMedica (UK) Ltd. (“Oxford BioMedica”), pursuant to which the Company received a worldwide, exclusive, royalty-bearing, sub-licensable license under certain patents and other intellectual property controlled by Oxford BioMedica to develop and commercialize OXB-102 (now AXO-Lenti-PD) and related gene therapy products (collectively, the “Gene Therapy Products”) for all diseases and conditions. The Company’s near-term focus is to develop the gene therapy product candidate, which it refers to as AXO-Lenti-PD, as a one-time treatment for Parkinson’s disease. The Company intends to begin a Phase 1/2 study of AXO-Lenti-PD in advanced Parkinson’s disease patients before the end of 2018.

The Company plans to make a determination of the overall development strategy for nelotanserin once the Company has reviewed final data from our currently ongoing Phase 2 study of nelotanserin in Phase 2 Sleep REM Behavior Disorder and completed our ongoing comprehensive clinical, regulatory and commercial review. In addition, the Company has the rights to develop RVT -104, a combination of rivastigmine and a peripheral muscarinic receptor antagonist, and is exploring the development of this product candidate as a potential treatment for patients with Alzheimer's disease or DLB.

The Company has determined that it has one operating and reporting segment as it allocates resources and assesses financial performance on a consolidated basis. The Company does not expect to generate revenue unless and until it successfully completes development and obtains regulatory approval for a product. The Company believes it currently has sufficient funds to meet its financial needs for at least the next 12 months. The Company will be required to obtain further funding through other public or private offerings of its share capital, debt financing, collaboration and licensing arrangements or other sources. Adequate additional funding may not be available to the Company on acceptable terms, or at all.

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Note 2—Summary of Significant Accounting Policies

(A) Basis of Presentation:

The Company's fiscal year ends on March 31, and its fiscal quarters end on June 30, September 30, and December 31. The accompanying consolidated financial statements have been prepared in accordance with accounting principles generally accepted in the United States ("U.S. GAAP"). Any reference in these notes to applicable guidance is meant to refer to the authoritative U.S. GAAP as found in the Accounting Standards Codification (''ASC'') and Accounting Standards Update (''ASU'') of the Financial Accounting Standards Board (''FASB''). The consolidated financial statements include the accounts of the Company and ASI, AHL and ASG, its wholly-owned subsidiaries. The Company has no unconsolidated subsidiaries. All intercompany balances and transactions have been eliminated in consolidation. Certain prior year amounts have been reclassified to conform with the current period presentation. These reclassifications had no effect on the previously reported results of operations.

(B) Use of Estimates:

The preparation of financial statements in conformity with U.S. GAAP requires management to make estimates and assumptions that affect the amounts reported in the financial statements and accompanying notes. The Company regularly evaluates estimates and assumptions related to the assets, liabilities, costs and expenses (including compensation expense) allocated to the Company under its services agreements with Roivant Sciences, Inc. ("RSI") and Roivant Sciences GmbH ("RSG"), each a wholly-owned subsidiary of the Company's majority shareholder, RSL, as well as contingent liabilities, share-based compensation and research and development costs. The Company bases its estimates and assumptions on historical experience and on various other factors that it believes 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 could differ from those estimates.

(C) Risks and Uncertainties:

The Company is subject to risks common to companies in the pharmaceutical industry including, but not limited to, uncertainties related to commercialization of products, regulatory approvals, dependence on key products, dependence on key customers and suppliers, and protection of intellectual property rights.

(D) Concentrations of Credit Risk:

Financial instruments that potentially subject the Company to concentration of credit risk include cash. At March 31, 2018, substantially all of the cash balances are deposited in four banking institutions and are all in excess of insured levels.

(E) Property and Equipment:

Property and equipment, consisting of leasehold improvements, furniture and fixtures, computers, software and other office equipment, is recorded at cost. Maintenance and repairs that do not improve or extend the lives of the respective assets are expensed to operations as incurred. Upon disposal, retirement or sale, the related cost and accumulated depreciation is removed from the accounts and any resulting gain or loss is included in the results of operations. Depreciation is recorded for property and equipment using the straight-line method over the estimated useful lives of the respective assets, generally three to five years, once the asset is installed and placed in service. Amortization of leasehold improvements is recorded over the shorter of the lease term or estimated useful life of the related asset. The Company reviews the recoverability of all long-lived assets, including the related useful lives, whenever events or changes in circumstances indicate that the carrying amount of a long-lived asset might not be recoverable. Recoverability is measured by comparison of the book values of the assets to future net undiscounted cash flows that the assets are expected to generate. If such assets are considered to be impaired, the impairment to be recognized is measured by the amount by which the book value of the assets exceed their fair value, which is measured based on the projected discounted future net cash flows arising from the assets.

(F) Debt Issuance Costs and Debt Discount:

Debt issuance costs related to a recognized debt liability are presented on the balance sheet as a direct deduction from the carrying amount of that debt liability, consistent with debt discounts, and are amortized to interest expense over the term of the related debt using the effective interest method. Further, debt discounts created as a result of the allocation of proceeds received from a debt issuance to warrants issued in conjunction with the debt issuance are amortized to interest expense under the effective interest method over the life of the recognized debt liability.

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(G) Research and Development Expense:

Research and development costs are expensed as incurred. Clinical study costs are accrued over the service periods specified in the contracts and adjusted as necessary based upon an ongoing review of the level of effort and costs actually incurred. Payments for a product license prior to regulatory approval of the product and payments for milestones achieved prior to regulatory approval of the product are expensed in the period incurred as research and development. Milestone payments made in connection with regulatory approvals are capitalized and amortized to cost of revenue over the remaining useful life of the asset. Research and development costs primarily consist of the intellectual property and research and development materials acquired from GlaxoSmithKline ("GSK") and Arena Pharmaceuticals GmbH ("Arena") (See Note 3), certain costs charged by RSI and RSG under their services agreements with the Company (See Note 6) and expenses from third parties who conduct research and development activities on behalf of the Company. The Company expenses in-process research and development projects acquired as asset acquisitions which have not reached technological feasibility and which have no alternative future use. For the years ended March 31, 2018, 2017 and 2016, the Company recorded $141.4 million, $134.8 million and $76.6 million, respectively, of research and development expense, of which $16.6 million, $19.2 million and $30.6 million, respectively, was attributable to share-based compensation expense.

(H) Income Taxes:

Deferred tax assets and liabilities are recognized for the future tax consequences attributable to differences between the financial statement carrying amounts of existing assets and liabilities and the 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 recovered or settled. The effect on deferred tax assets and liabilities of a change in tax rates is recognized in income in the period that includes the enactment date. A valuation allowance is recorded when, after consideration of all positive and negative evidence, it is not more likely than not that the Company's deferred tax assets will be realizable. When uncertain tax positions exist, the Company recognizes the tax benefit of tax positions to the extent that the benefit will more likely than not be realized. The determination as to whether the tax benefit will more likely than not be realized is based upon the technical merits of the tax position as well as consideration of the available facts and circumstances. When and if the Company were to recognize interest and penalties related to unrecognized tax benefits, they would be reported in tax expense in the consolidated statement of operations.

(I) Share-Based Compensation:

Share-based awards to employees and directors are valued at fair value on the date of grant and that fair value is recognized on a straight-line basis over the requisite service period of the entire award. The Company values its stock options using the Black-Scholes option pricing model. Certain assumptions need to be made with respect to utilizing the Black-Scholes option pricing model, including the expected life of the award, volatility of the underlying shares and the risk-free interest rate. The expected life of the stock options is calculated using the simplified method (based on the mid-point between the vesting date and the end of the contractual term). The risk-free interest rate is based on the rates paid on securities issued by the U.S. Treasury with a term approximating the expected life of the equity award. The expected share price volatility for the Company's common shares was estimated by taking the average historical price volatility for industry peers. As of April 1, 2017, the Company elected to change its policy from estimating forfeitures to recognizing forfeitures of awards when they occur (See Note 2(L)). Prior to this change, estimates of pre-vesting award forfeitures were based on the Company's expectations of future employee turnover and the Company adjusted its estimate of forfeitures over the requisite service period based on the extent to which actual forfeitures differed, or were expected to differ, from such estimates. Changes in estimated forfeitures were recognized through a cumulative catch-up adjustment in the period of change and impacted the amount of compensation expense to be recognized in future periods.

The Company accounts for share-based payments to non-employees issued in exchange for services based upon the fair value of the equity instruments issued. Compensation expense for stock options issued to non-employees is calculated using the Black-Scholes option pricing model and is recorded over the service performance period. Options subject to vesting are required to be periodically remeasured over their service performance period, which is generally the same as the vesting period.

(J) Net Loss per Common Share:

Basic net loss per common share is computed by dividing the net loss applicable to common shareholders by the weighted-average number of common shares outstanding during the year. Diluted net loss per common share is computed by dividing the net loss applicable to common shareholders by the diluted weighted-average number of common shares outstanding during the year calculated in accordance with the treasury stock method. Stock options and a warrant to purchase a total of 14.1 million, 8.1 million and 5.9 million common shares were not included in the calculation of diluted weighted-average common shares outstanding for the years ended March 31, 2018, 2017 and 2016, respectively, because they were anti-dilutive given the net loss of the Company.

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(K) Financial Instruments:

The Company utilizes fair value measurement guidance prescribed by accounting standards to value its financial instruments.

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

Fair value is identified as the exchange price, or exit price, representing the amount that would be received from the sale of an asset or paid to transfer a liability in an orderly transaction between market participants. As a basis for considering market participant assumptions in fair value measurements, the guidance establishes a three-tier fair value hierarchy that distinguishes among the following:

- Level 1-Valuations are based on unadjusted quoted prices in active markets for identical assets or liabilities that the Company has the ability to access.
- Level 2-Valuations are based on quoted prices for similar assets or liabilities in active markets, quoted prices for identical or similar assets or liabilities in markets that are not active and models for which all significant inputs are observable, either directly or indirectly.
- Level 3-Valuations are based on inputs that are unobservable (supported by little or no market activity) and significant to the overall fair value measurement.

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

The Company's financial instruments include cash, accounts payable and debt. Cash and accounts payable are stated at their respective historical carrying amounts, which approximate fair value due to their short-term nature. The carrying value of the Company’s debt was $52.7 million at March 31, 2018, which approximates fair value based on current interest rates for similar types of borrowings and is in Level 2 of the fair value hierarchy. See Note 5 for the actual book carrying value of the Company's debt at March 31, 2018.

(L) Recently Issued Accounting Pronouncements:

In February 2016, the FASB issued ASU No. 2016-02, “Leases (Topic 842)” (“ASU No. 2016-02”), which is a comprehensive new lease standard that amends various aspects of existing accounting guidance for leases. The core principle of ASU No. 2016-02 will require lessees to present the assets and liabilities that arise from leases on their balance sheets. ASU No. 2016-02 is effective for annual periods beginning after December 15, 2018, and interim periods within fiscal years beginning after December 15, 2018. Early adoption is permitted. The Company is currently evaluating ASU No. 2016-02 and its impact on the Company's consolidated financial position and results of operations.

In March 2016, the FASB issued ASU No. 2016-09, “Compensation - Stock Compensation (Topic 718): Improvements to Employee Share-Based Payment Accounting” (“ASU No. 2016-09”). ASU No. 2016-09 makes several modifications to Topic 718 related to the accounting for forfeitures, employer tax withholding on share-based compensation, and the financial statement presentation of excess tax benefits or deficiencies. ASU No. 2016-09 also clarifies the statement of cash flows presentation for certain components of share-based awards. The Company adopted this guidance as of April 1, 2017, using a modified retrospective transition method. As a result of the adoption of ASU No. 2016-09, the Company elected to change its policy from estimating forfeitures to recognizing forfeitures when they occur and, as a result, recorded an adjustment of $235,000 to increase accumulated deficit with a corresponding offset to paid in capital as of April 1, 2017. The other requirements of ASU No. 2016-09 did not have a material impact on the Company's consolidated financial statements and related disclosures.

In October 2016, the FASB issued ASU No. 2016-16, “Intra-Entity Transfers of Assets Other Than Inventory” (“ASU No. 2016-16”). ASU No. 2016-16 requires the income tax consequences of intra-entity transfers of assets other than

inventory to be recognized as current period income tax expense or benefit and removes the requirement to defer and amortize the consolidated tax consequences of intra-entity transfers. The new standard will be effective for the Company on April 1, 2018 and will be adopted using a modified retrospective approach which requires a cumulative effect adjustment to retained earnings as of the beginning of the period of adoption. The Company is currently evaluating the new standard and its impact on the Company’s consolidated financial statements and related disclosures.

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In January 2017, the FASB issued ASU 2017-01, ‘‘Business Combinations (Topic 805): Clarifying the Definition of a Business’’ (‘‘ASU No. 2017-01’’), which clarifies the definition of a business with the objective of adding guidance to assist entities with evaluating whether transactions should be accounted for as acquisitions (or disposals) of assets or businesses. ASU No. 2017-01 is effective for annual reporting periods beginning after December 15, 2017, and interim periods within those years, with early adoption permitted. The Company will apply the guidance to applicable transactions after the adoption date. The impact on the Company’s consolidated financial statements will depend on the facts and circumstances of any specific future transactions.

In May 2017, the FASB issued ASU No. 2017-09, “Scope of Modification Accounting” (‘‘ASU No. 2017-09’’). ASU No. 2017-09 clarifies which changes to the terms or conditions of a share-based payment award require an entity to apply modification accounting. ASU No. 2017-09 is effective for interim and annual reporting periods beginning after December 15, 2017 and early adoption is permitted. The Company does not expect that this standard will have a material impact on the Company’s consolidated financial statements and related disclosures.

In February 2018, the FASB issued ASU No. 2018-02, “Income Statement-Reporting Comprehensive Income (Topic 220): Reclassification of Certain Tax Effects from Accumulated Other Comprehensive Income” (“ASU No. 2018-02”). ASU No. 2018-02 allows companies to reclassify stranded tax effects resulting from the Tax Cuts and Jobs Act, from accumulated other comprehensive (loss) income to retained earnings. ASU No. 2018-02 is effective for interim and annual reporting periods beginning after December 15, 2017 and early adoption is permitted. The Company is currently evaluating the new standard and its impact on the Company’s consolidated financial statements and related disclosures.

In March 2018, the FASB issued ASU No. 2018-05, “Income Taxes (Topic 740): Amendments to SEC Paragraphs Pursuant to SEC Staff Accounting Bulletin No. 118,” (“ASU No. 2018-05”). ASU No. 2018-05 amends certain SEC material in Topic 740 for the income tax accounting implications of the recently issued Tax Cuts and Jobs Act. ASU No. 2018-05 is effective immediately. The Company evaluated the impact of the Act as well as the guidance of Staff Accounting Bulletin 118 and incorporated the changes into the determination of a reasonable estimate of deferred taxes and appropriate disclosures in the notes to the Company’s consolidated financial statements. The Company will continue to evaluate the impact this tax reform legislation may have on our results of operations, financial position, cash flows and related disclosures.

(M) Foreign Currency:

The Company has operations in the United States, the United Kingdom and Switzerland. The results of its non-U.S. dollar based functional currency operations are translated to U.S. dollars at the average exchange rates during the year. The Company’s assets and liabilities are translated using the current exchange rate as of the balance sheet date and shareholders’ equity is translated using historical rates. Adjustments resulting from the translation of the financial statements of the Company’s foreign functional currency subsidiaries into U.S. dollars are excluded from the determination of net loss and are accumulated in a separate component of shareholders’ equity. Foreign exchange transaction gains and losses are included in other (income) expense in the Company’s results of operations.

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Note 3—Asset Acquisitions

(A) Intepirdine:

On December 17, 2014, the Company entered into an asset purchase agreement (the "Asset Purchase Agreement") to acquire certain intellectual property and research and development materials from GSK, which the Company initially named RVT-101, now known as intepirdine. At the date of the transaction, the Company assessed the likelihood of making a milestone payment as probable (it was made in June 2016) and recorded $5.0 million as research and development expense. In light of the data from recent trials, the Company has discontinued any further development of intepirdine.

(B) Nelotanserin:

On October 28, 2015, the Company acquired the global rights to nelotanserin, an inverse agonist of the 5-HT_{2A} receptor, from RSL. Pursuant to the terms of the Waiver and Option Agreement between RSL and the Company entered into in May 2015 (the ''Waiver and Option Agreement''), RSL granted the Company an option to acquire all of RSL's rights, title and interest in and to the development, marketing and supply agreement for nelotanserin with Arena (the ''Arena Development Agreement''), together with any amendments and related side letters or other agreements. The option became exercisable beginning on September 16, 2015 and, if not exercised, would have expired on December 16, 2016. The Company exercised the option on October 28, 2015 and acquired all of RSL's rights, title, interests and obligations under the Arena Development Agreement for nelotanserin and accounted for the acquisition of nelotanserin as an asset acquisition. The Company recorded $5.3 million as research and development expense which reflects 110% of payments made by RSL to Arena, including a $4.0 million up-front payment, and costs incurred in connection with the development of nelotanserin, in each case pursuant to the Waiver and Option Agreement prior to the exercise of the option.

The Company may be responsible for future contingent payments under the Arena Development Agreement, including up to $4.0 million in potential development milestone payments, up to $37.5 million in potential regulatory milestone payments and up to $60.0 million in potential commercial milestone payments. The Company is also obligated to purchase all commercial supplies of nelotanserin from Arena for a fixed price equal to 15% of net sales of nelotanserin.

For the consideration above, the Company also received a small quantity of inventory of nelotanserin, and certain research and development historical records. The Company did not hire, or receive, any employees working on the development of nelotanserin, or any research, clinical or manufacturing equipment. Additionally, the Company did not assume from Arena any contracts, licenses or agreements between Arena and any third party with respect to nelotanserin. The Company will need to independently develop all clinical processes and procedures for future clinical studies of nelotanserin through the use of internal and external resources.

As the intellectual property and inventory of nelotanserin acquired had no alternative future use on the date of acquisition, it was accounted for as an asset acquisition and the Company recorded the $5.3 million upfront payment as research and development expense related to its option exercised with RSL on October 28, 2015.

(C) License Agreement with Qaam Pharmaceuticals, LLC:

In August 2016, the Company entered into an exclusive license agreement with Qaam Pharmaceuticals, LLC (''Qaam'') for intellectual property covering the combination of cholinesterase inhibitors with peripheral muscarinic receptor antagonists and the Company expects to develop and, if successful, commercialize a product covered by the licensed intellectual property. The Company expects to develop RVT-104, a combination of a peripheral muscarinic receptor antagonist and high-dose rivastigmine. The Company paid an initial license fee of $0.6 million which was recorded as research and development expense in the accompanying consolidated statements of operations.

Note 4—Accrued Expenses

As of March 31, 2018 and 2017, accrued expenses consisted of the following (in thousands):

	March 31, 2018	March 31, 2017
Research and development expenses	$21,855	$ 27,667

Salaries, bonuses, and other compensation expenses	7,718	3,497
Legal expenses	779	1,271
Other expenses	1,510	2,361
Total accrued expenses	$31,862	$ 34,796

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Note 5—Long Term Debt

On February 2, 2017, the Company and its subsidiaries, AHL, ASG and ASI entered into a loan and security agreement (as amended on May 24 and September 22, 2017, the “Loan Agreement”) with Hercules Capital, Inc., (“Hercules”), under which the Company, AHL and ASG (the "Borrowers") borrowed an aggregate of $55.0 million (the “Term Loan”). Pursuant to the Loan Agreement, ASI has issued a guaranty of the Borrowers’ obligations under the Loan Agreement. The Term Loan bears interest at a variable per annum rate calculated for any day as the greater of either (i) the prime rate plus 6.80%, and (ii) 10.55%. The Term Loan has a scheduled maturity date of March 1, 2021. The Borrowers are obligated to make monthly payments of accrued interest under the Loan Agreement until September 1, 2018, followed by monthly installments of principal and interest beginning October 1, 2018 through March 1, 2021. In connection with the Loan Agreement, the Borrowers and ASI, as guarantor, granted Hercules a first position lien on substantially all of their respective assets, excluding intellectual property. Prepayment of the Term Loan is subject to penalty.

On May 24, 2017, the Loan Agreement was amended such that the required minimum amount of unrestricted cash applied commencing on July 1, 2017 and is equal to the lesser of (i) $35.0 million (the “Applicable Amount”) plus certain aged accounts payable amounts (as further defined in the Loan Agreement) and (ii) the outstanding amount of debt under the Loan Agreement plus certain aged accounts payable (as further defined in the Loan Agreement), provided that the Applicable Amount may be lowered to $30 million upon the achievement of certain clinical milestones as set forth in the Loan Agreement.

The Loan Agreement also includes customary events of default. Upon the occurrence of an event of default, a default interest rate of an additional 5.0% may be applied to the outstanding principal balance, and Hercules may declare all outstanding obligations immediately due and payable and take such other actions as set forth in the Loan Agreement. As of March 31, 2018, the Company was in compliance with its covenants and obligations under the Loan Agreement. In addition, for so long as the Term Loan remains outstanding, the Company shall be required to use its commercially reasonable efforts to afford Hercules the opportunity to participate in future underwritten equity offerings of the Company’s common shares up to a total of $3.0 million.

In connection with the Loan Agreement, the Company issued a warrant to Hercules, exercisable for an aggregate of 274,086 of the Company’s common shares at an exercise price of $12.04 per share (the “Warrant”). In August 2017, Hercules exercised the Warrant on a cashless basis and received a net issuance of 129,827 of the Company's common shares.

The Company has accounted for the Warrant as an equity instrument since it was indexed to the Company’s common shares and met the criteria for classification in shareholders’ equity. The relative fair value of the Warrant on the date of issuance was approximately $2.3 million and was treated as a discount to the debt. This amount will be amortized to interest expense using the effective interest method over the life of the Term Loan, which is a period of 48 months. The Company estimated the value of the Warrant using the Black-Scholes model. The key assumptions used to value the Warrant were as follows:

Exercise price	$12.04
Share price on date of issuance	$11.96
Volatility	77.6 %
Risk-free interest rate	2.27 %
Expected dividend yield	— %
Contractual term (in years)	7

In addition, at the closing of the Term Loan, the Company paid transaction costs of $1.5 million, which were recorded as a discount on the debt and will be amortized to interest expense using the effective interest method over the life of the Term Loan, which is a period of 48 months.

Outstanding debt obligations are as follows (in thousands):

	March 31, 2018	March 31, 2017
Principal amount	$55,000	$55,000

Less: unamortized discount and debt issuance costs	(2,322)	(3,564)
Loan payable less unamortized discount and debt issuance costs	52,678	51,436
Less: current portion of long term debt	(9,753)	—
Long-term loan payable, net of current maturities	$42,925	$51,436

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Note 6—Related Party Transactions

(A) Services Agreements:

During 2015, the Company and ASI entered into a services agreement with RSI (the ‘‘Services Agreement’’) under which RSI agreed to provide certain administrative and research and development services to the Company. The Company and ASI amended and restated the Services Agreement with RSI on October 13, 2015 for the fiscal year commencing April 1, 2015. Under the Services Agreement, as amended and restated, the Company pays or reimburses RSI for any expenses it, or third parties acting on its behalf, incurs for the Company. For any general and administrative and research and development activities performed by RSI employees, RSI charges back the employee compensation expense plus a pre-determined mark-up. Employee compensation expense, inclusive of base salary and fringe benefits, is determined based upon the relative percentage of time utilized on Company matters. All other costs are billed back at cost. The accompanying audited consolidated financial statements include third-party expenses that have been paid by RSI and RSL.

In February 2017, the Company and ASI amended and restated the Services Agreement, effective as of December 13, 2016, to add ASG as a services recipient. In addition, in February 2017, ASG entered into a separate services agreement with RSG, a wholly-owned subsidiary of RSL, effective as of December 13, 2016, for the provision of services by RSG to ASG in relation to the identification of potential product candidates and project management of clinical trials, as well as other services related to development, administrative and financial activities.

Under the services agreements, for the years ended March 31, 2018, 2017 and 2016, the Company incurred expenses of $8.5 million, $7.9 million and $7.6 million, respectively, inclusive of the mark-up.

For the years ended March 31, 2018, 2017 and 2016 the Company recorded compensation arrangement expense of $0, $41 thousand and $1.0 million provided to Vivek Ramaswamy as RSI’s Chief Executive Officer by one of RSL’s investors, respectively.

(B) Information Sharing and Cooperation Agreement:

In March 2015, the Company entered into an information sharing and cooperation agreement (the “Cooperation Agreement”) with RSL. The Cooperation Agreement, among other things, grants the Company a right of first review on any potential dementia-related product or investment opportunity that RSL may consider pursuing and obligates the Company to deliver periodic financial statements and other financial information to RSL and comply with other specified financial reporting requirements. On May 1, 2015, the Company received an offer notice, as defined in the Cooperation Agreement, from RSL relating to the opportunity to acquire, from Arena, certain rights to develop and market nelotanserin. On May 8, 2015, the Company entered into a Waiver and Option Agreement with RSL with respect to such opportunity and RSL entered into the Arena Development Agreement.

Pursuant to the terms of the Waiver and Option Agreement, RSL granted the Company an option to acquire all of RSL’s right, title, interest and obligations in and to the Arena Development Agreement, together with any amendments and related side letters or other agreements. The option became exercisable beginning on September 16, 2015 and, if not exercised, would have expired on December 16, 2016. The Company exercised the option on October 28, 2015 (See Note 3). Following exercise of the option, the Services Agreement between the Company and RSI was applied with regard to any reimbursements made by the Company to RSL.

(C) Family Relationships:

Geetha Ramaswamy, MD, formerly the Vice President, Medical and Scientific Strategy for ASI, is the mother of Vivek Ramaswamy, a director of ASL, a director of RSL and a director and the Chief Executive Officer of RSI. Shankar Ramaswamy, MD, the Vice President, Global Medical Affairs of ASI, is the brother of Vivek Ramaswamy. Sarah Friedhoff, formerly Senior Business Operations and Research and Development Specialist of ASI, is the daughter of Lawrence Friedhoff, MD, PhD, formerly the Chief Development Officer of ASI and currently Chief of Research & Development of RSI. Lawrence Friedhoff, MD, PhD, Geetha Ramaswamy, MD and Sarah Friedhoff are no longer employed by ASI beginning in October 2017.

Salary expenses were $267,800, $259,167 and $239,583 for Shankar Ramaswamy, $133,900, $259,167 and $239,583 for Geetha Ramaswamy and $38,625, $74,167 and $42,709 for Sarah Friedhoff for the years ended March 31, 2018, 2017 and 2016, respectively.

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Note 7—Shareholders' Equity

(A) Overview:

The Company's Memorandum of Association, filed on October 31, 2014 in Bermuda, authorized the issuance of one class of shares. The total number of shares which the Company was authorized to issue was 10,000, each with a par value of $1.00 per share. Upon the Company's formation, RSL subscribed for 100 shares of the Company's share capital. On December 17, 2014, RSL paid the initial $5.0 million payment to GSK upon the closing of the transaction on behalf of the Company (See Note 3) which is reflected in the financial statements as an additional capital contribution. There were no additional shares issued in connection with such contributions to additional paid-in-capital as RSL owned 100% of the share ownership. On March 18, 2015, upon approval of the Board of Directors, the Company issued an additional 650 shares, increasing the total number of issued and outstanding shares to 750, which were reflected in the accompanying financial statements as 65,000,000 and 75,000,000, respectively, post stock split. Effective March 18, 2015, upon approval of the Board of Directors and the Company's sole member, RSL, the Company effected a stock split of the authorized, issued and outstanding shares of the Company at a ratio of 100,000-to-1. The stock split increased the total number of authorized shares from 10,000 to 1,000,000,000, increased the total number of shares issued and outstanding from 750 to 75,000,000, and decreased par value per share from $1.00 to $0.00001. All information in the accompanying consolidated financial statements and notes thereto regarding common share amounts and prices per common share has been adjusted to reflect the application of the stock split on a retroactive basis.

(B) Transactions:

In April 2015, RSL made a cash capital contribution of $0.8 million. No additional common shares of the Company were issued in connection with this capital contribution.

On June 16, 2015, the Company completed its initial public offering ("IPO") of common shares. The Company sold 24,150,000 shares at a price of $15.00 per share, which included 3,150,000 common shares issued upon the full exercise of the underwriters' option to purchase additional shares, for gross proceeds of $362.3 million. The Company received net proceeds of $334.5 million, net of an aggregate of $27.7 million in underwriting discounts and commissions and offering expenses.

In April 2017, the Company issued and sold 7,753,505 common shares, including 1,011,326 common shares sold pursuant to the exercise in full of the underwriters' option to purchase additional shares, at an offering price of $18.54 per common share for gross proceeds of $143.7 million. The net proceeds to the Company were $134.5 million, after deducting underwriting discounts and commissions and offering expenses paid by the Company.

In 2018, RSL incurred $0.3 million of expenses on behalf of the Company. This amount was treated as a capital contribution.

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Note 8—Share-Based Compensation

Stock Options:

In March 2015, the Company adopted its 2015 Equity Incentive Plan (the ‘‘2015 Plan’’), under which 7.5 million of the Company’s common shares were originally reserved for grant. The Company's employees, directors and consultants are eligible to receive non-qualified and incentive stock options, stock appreciation rights, restricted stock awards, restricted stock unit awards, and other stock awards under the plan. Options granted to consultants and employees generally vest over four years and have a ten-year contractual term. Options granted to members of the Board of Directors vest over three years and have a ten-year contractual term. In May 2015, the Company’s Board of Directors amended the 2015 Plan to increase the number of common shares authorized for issuance thereunder to 9.5 million common shares. The amendment of the 2015 Plan became effective upon the execution of the underwriting agreement relating to the Company's initial public offering of common shares in June 2015. On April 1, 2016, the number of common shares authorized for issuance increased automatically to 12.5 million in accordance with the 2015 Plan. On April 1, 2017, the number of common shares authorized increased automatically to 16.5 million in accordance with the 2015 Plan. In June 2017, the Company's Board of Directors amended and restated the 2015 Plan to, among other things, increase the number of common shares authorized for issuance thereunder to approximately 20.5 million common shares. The amended and restated 2015 Plan became effective upon shareholder approval in August 2017. Stock options granted under the 2015 Plan provide option holders, if approved by the Board of Directors, the right to exercise their options prior to vesting. In the event that an option holder exercises the unvested portion of any option, such unvested portion will be subject to a repurchase option held by the Company at the lower of (1) the fair market value of its common shares on the date of repurchase and (2) the exercise price of the options. Any common shares underlying such unvested portion will continue to vest in accordance with the original vesting schedule of the option. Prior to the IPO, the fair value of the Company’s common shares underlying stock options was estimated on each grant date by the Board of Directors. In order to determine the fair value of the Company’s common shares underlying granted stock options, the Board of Directors considered, among other things, valuations of the common shares prepared by an unrelated third-party valuation firm in accordance with the guidance provided by the American Institute of Certified Public Accountants Practice Guide, Valuation of Privately-Held-Company Equity Securities Issued as Compensation. In connection with the Company’s IPO and after preliminary discussions with the underwriters, the Company reassessed the determination of the fair value of the common shares underlying 4,012,500 stock options granted in March 2015 and 527,500 stock options granted in April 2015. As a result, the Company determined that the fair value of the common shares as of April 13, 2015 was $15.00 per share, which was higher than the fair values of $0.90 per share and $1.04 per share as initially determined by the Board of Directors on the dates of grant in March 2015 and April 2015, respectively. The use of this higher share price increased both recognized and unrecognized share-based compensation expense and also impacted the valuation of the RSL awards share compensation expense (See Note 8(B)(2)).

On March 1, 2018, the Board of Directors approved the repricing of 1,264,085 stock options previously granted to 51 individuals, including some now employed by RSI. The revised exercise price for these options is $1.49, the closing price for the Company's common shares on March 1, 2018. The Company immediately recorded $0.1 million of additional share-based compensation expenses related to 146,370 vested options and increased unrecognized compensation related to 1,117,715 non-vested options by $0.5 million, which is expected to be recognized over the remaining service period of the non-vested options.

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At March 31, 2018, a total of 5.6 million common shares were available for future issuance under the 2015 Plan. The Company estimated the fair value of each option on the date of grant using the Black-Scholes closed-form option-pricing model applying the weighted average assumptions in the following table:

	Years Ended March 31,		
	2018	2017	2016
Expected share price volatility	79.6%	79.6%	77.9%
Expected risk free interest rate	2.33%	1.58%	1.70%
Expected term, in years	6.50	6.30	6.58
Expected dividend yield	— %	— %	— %

The following table presents a summary of option activity and data under the Company's stock incentive plans through March 31, 2018:

	Number of Options	Weighted Average Exercise Price	Weighted Average Grant Date Fair Value	Weighted Average Remaining Contractual Life	Aggregate Intrinsic Value
Options outstanding at March 31, 2015	4,012,500	$ 0.90	$ 14.30	9.96	$56,576,250
Granted	1,983,808	12.10	11.89	—	—
Exercised	—	—	—	—	—
Forfeited	(102,725)	4.99	13.41	—	—
Cancelled	—	—	—	—	—
Options outstanding at March 31, 2016	5,893,583	$ 4.60	$ 13.50	9.11	$47,172,525
Granted	2,642,500	13.08	9.06	—	—
Exercised	(13,919)	2.57	13.28	—	141,796
Forfeited	(682,130)	4.26	12.86	—	—
Cancelled	—	—	—	—	—
Options outstanding at March 31, 2017	7,840,034	$ 7.49	$ 12.06	8.49	$61,104,445
Granted	17,192,085	10.14	6.94		
Exercised	(740,823)	2.13	13.85		13,002,098
Forfeited	(10,206,160)	14.66	10.07		
Cancelled	—	—	—		
Options outstanding at March 31, 2018	14,085,136	$ 5.51	$ 6.59	8.73	$1,347,255
Options vested and expected to vest at March 31, 2018	14,085,136	$ 5.51	$ 6.59	8.73	$1,347,255
Options exercisable at March 31, 2018	11,042,482	$ 4.70	$ 6.59	8.64	$1,347,255

At March 31, 2018, there were 3.6 million vested options outstanding.

(A) Stock Options Granted to Employees and Directors:

During the years ended March 31, 2018, 2017 and 2016, the Company granted to its employees and directors a total of 16.1 million, 2.6 million and 1.8 million options, respectively, with weighted average exercise prices of $9.56, $13.09 and $11.96, respectively, and recorded related share-based compensation expense of $21.0 million, $23.1 million and $16.3 million, respectively. This share-based compensation expense is included in research and development and general and administrative expenses in the accompanying consolidated statements of operations. At March 31, 2018, total unrecognized compensation expense related to non-vested options was $39.4 million and is expected to be recognized over the remaining weighted-average service period of 2.52 years.

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(B) Share-Based Compensation for Related Parties:

(1) Stock Options Granted to Non-Employees:

During the years ended March 31, 2018, 2017 and 2016, the Company granted stock options to purchase 1,046,600, 86,700 and 215,000 shares, respectively, of the Company's common shares to employees of RSI as compensation for support services provided to the Company. The fair value of the stock options granted to RSI employees is accounted for by the Company in accordance with the authoritative guidance for non-employee equity awards and is remeasured on each valuation date until performance is complete using the Black-Scholes pricing model.

Each award is subject to a specified vesting schedule. Compensation expense will be recognized by the Company over the required service period to earn each award. The Company recorded $4.8 million, $1.6 million and $1.1 million of share-based compensation expense, respectively, for the years ended March 31, 2018, 2017 and 2016. The share-based compensation was recorded as research and development and general and administrative expense in the accompanying consolidated statements of operations. The total remaining unrecognized compensation cost related to the non-vested stock options amounted to $1.1 million as of March 31, 2018, which will be recognized over the weighted-average remaining requisite service period of 2.55 years.

(2) Share-Based Compensation Allocated to the Company by RSL:

The Company incurs share-based compensation expense for RSL common share awards and RSL options issued by RSL to RSL and RSI employees. Share-based compensation expense is allocated to the Company by RSL based upon the relative percentage of time utilized by RSL, RSG and RSI employees on Company matters.

These share-based compensation amounts include compensation expense for awards made by BVC Ltd. (‘‘BVC’’) prior to the BVC Merger on December 4, 2015. On December 4, 2015, BVC, a non-public entity, which held a non-controlling ownership interest in RSL, the majority shareholder of the Company, was merged with and into RSL (the ‘‘BVC Merger’’), with RSL as the surviving entity. Prior to the BVC Merger, the Company recorded share-based compensation expense, in relation to the share-based awards issued by BVC to RSI employees based on the changes in fair value of share-based awards which were remeasured at each reporting period date until performance was completed. As these BVC share-based awards were not based on the Company's or RSL’s shares, they were remeasured at each reporting period date until performance was completed. As a result of the BVC Merger, all outstanding BVC share-based awards were converted into RSL common share awards, with the same vesting and forfeiture terms as the original grant. The RSL common share awards and RSL options are fair valued on the date of grant and that fair value is recognized over the requisite service period. On December 8, 2015 following the BVC Merger, RSL was recapitalized in conjunction with a private financing. The estimated fair value of these RSL common share awards was determined by the valuation of RSL in the December 8, 2015 private financing. As RSL is a non-public entity, the majority of the inputs used to estimate the fair value of the BVC awards prior to the BVC Merger and the RSL common share awards following the BVC Merger are classified as level 3 due to their unobservable nature. Significant judgment and estimates were used to estimate the fair value of these RSL awards and RSL options, as they are not publicly traded. RSL common share awards and RSL options are subject to specified vesting schedules and requirements (a mix of time-based and performance-based events). The fair value is based on various corporate event-based considerations, including targets for RSL’s post-IPO market capitalization and future financing events. The fair value of each RSL option is estimated on the date of grant using the Black-Scholes closed-form option-pricing model.

The Company recorded share-based compensation expense of $5.4 million, $10.9 million and $53.4 million, respectively, for the years ended March 31, 2018, 2017 and 2016, in relation to the RSL common share awards and options issued by RSL to RSL and RSI employees.

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(3) Share-Based Compensation for Family Members:

In March 2015, Geetha Ramaswamy and Shankar Ramaswamy were granted stock options for 262,500 and 750,000 common shares of the Company, respectively, in each case with an exercise price of $0.90 per share. In September 2015, Sarah Friedhoff was granted stock options for 2,725 common shares of the Company. In April 2016, the Company granted Geetha Ramaswamy, Shankar Ramaswamy and Sarah Friedhoff stock options to purchase 43,000 common shares, 43,000 common shares and 10,000 common shares, respectively, as annual stock option grants in their capacities as employees of ASI. During the year ended March 31, 2018, the Company granted Geetha Ramaswamy, Shankar Ramaswamy and Sarah Friedhoff stock options to purchase 37,500 common shares, 587,500 common shares and 12,500 common shares, respectively. Geetha Ramaswamy, MD and Sarah Friedhoff are no longer employed by ASI beginning in October 2017. The Company recorded aggregate share-based compensation expense of $4.0 million, $3.6 million and $3.4 million, respectively, for the years ended March 31, 2018, 2017 and 2016 in connection with the Company's option grants.

Shankar Ramaswamy, while previously employed by RSI, was also granted restricted stock in BVC. Following the BVC Merger, this restricted stock in BVC was converted into RSL common share awards, subject to vesting and forfeiture terms consistent with the original grant (See Note 8 (B) (2)). For the years ended March 31, 2018, 2017 and 2016, respectively, the Company recorded share-based compensation expense of $0.5 million, $0.5 million and $0.5 million related to the RSL common share awards held by Shankar Ramaswamy (inclusive of the compensation expense noted above for BVC awards prior to the BVC Merger on December 4, 2015), which the Company has recorded as research and development expense in the accompanying consolidated statements of operations. At March 31, 2018, total unrecognized compensation expense related to these non-vested RSL common share awards was $0.1 million and is expected to be recognized over the remaining weighted average period of 0.27 years.

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Note 9—Income Taxes

The loss before income taxes and the related tax expense (benefit) are as follows (in thousands):

	Year ended March 31, 2018	Year ended March 31, 2017	Year ended March 31, 2016
Loss before income taxes:			
United States	$(13,039)	$(17,083)	$(13,955)
Switzerland	(197,765)	(55,594)	—
Bermuda	(9,697)	(109,334)	(119,207)
Other[1]	(151)	—	—
Total loss before income taxes	$(220,652)	$(182,011)	$(133,162)
Current taxes:			
United States	$(1,455)	$1,270	$184
Switzerland	—	—	—
Bermuda	—	—	—
Other[1]	(333)	56	122
Total current tax (benefit) expense	(1,788)	1,326	306
Deferred taxes:			
United States	2,669	(2,361)	(308)
Switzerland	—	—	—
Bermuda	—	—	—
Other[1]	40	(25)	(15)
Total deferred tax expense (benefit)	2,709	(2,386)	(323)
Total income tax expense (benefit)	$921	$(1,060)	$(17)

[1] Primarily United States state and local and United Kingdom activity

A reconciliation of income tax benefit computed at the Bermuda statutory rate to income tax expense (benefit) reflected in the financial statements is as follows (in thousands):

	Year Ended March 31, 2018		Year Ended March 31, 2017		Year Ended March 31, 2016	
	$	%	$	%	$	%
Income tax benefit at Bermuda statutory rate	$—	— %	$—	— %	$—	— %
Foreign rate differential[1]	(116,092)	52.88	(18,140)	9.96	(4,745)	3.56
Valuation allowance	113,070	(51.24)	18,607	(10.22)	5,194	(3.90)
Tax reform implications	4,543	(2.06)	—	—	—	—
Other	—	—	(1,527)	0.84	(466)	0.35
Total income tax expense (benefit)	$921	(0.42)%	$(1,060)	0.58 %	$(17)	0.01 %

[1] Related to current tax on United States operations including permanent and temporary difference (i.e. Research and Development credits), Switzerland net operating losses and United Kingdom taxation of the parent company.

The Company's effective tax rate for the years ended March 31, 2018, March 31, 2017 and March 31, 2016 was (0.42)%, 0.58% and 0.01%, respectively, driven by the Company's jurisdictional earnings by location and a valuation allowance that eliminates the Company's global net deferred tax assets.

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On December 22, 2017, the Tax Cuts and Jobs Act (the "Act") was enacted, which introduced a comprehensive set of tax reforms in the United States. The Act revises the U.S. corporate income tax law by, among other things, lowering the corporate income tax rate from 35% to 21%, adopting a quasi-territorial income tax system, imposing a one-time transition tax on foreign unremitted earnings and setting limitations on deductibility of certain costs.

The effects of changes in tax laws are required to be recognized in the period in which the legislation is enacted in accordance with ASC 740, Accounting for Income Taxes. However, due to the complexity and significance of the Act's provisions, the SEC staff issued Staff Accounting Bulletin No. 118 ("SAB 118"), which allows companies to record the tax effects of the Act on a provisional basis based on a reasonable estimate, and then, if necessary, subsequently adjust such amounts during a limited measurement period as more information becomes available. The measurement period ends when a company has obtained, prepared, and analyzed the information necessary to finalize its accounting, but cannot extend beyond one year from enactment.

The Act did not have a material impact on the Company's financial statements since its global net deferred tax assets are fully offset by a valuation allowance and the Company does not have any offshore earnings from which to record the mandatory transition tax. However, given the significant complexity of the Act, anticipated guidance from the U.S. Treasury about implementing the Act, and the potential for additional guidance from the SEC or the FASB related to the Act, these estimates may be adjusted during the measurement period. The provisional amounts for income taxes were based on the Company's present interpretations of the Act and current available information, including assumptions and expectations about future events, such as its projected financial performance, and are subject to further refinement as additional information becomes available (including potential new or interpretative guidance issued by the FASB or the Internal Revenue Service and other tax agencies) and further analyses are completed. The provisional amount recorded related to the remeasurement of the Company's deferred tax balances was $4.5 million which was offset fully by the provisional amount recorded related to the reversal of previously established valuation allowances against these deferred tax balances. The Act also permits any remaining AMT tax attribute carryforwards to be used to offset future taxable income and/or be refundable over the next several years. As a result, the Company recognized a provisional benefit of $0.1 million during the year ended March 31, 2018 related to the AMT tax credit carryforward. The related refundable amount has been classified in income tax receivable in the accompanying consolidated balance sheet.

The Company continues to analyze the changes in certain income tax deductions and gather additional data to compute the full impacts on the Company's current and deferred tax assets and liabilities (deferred tax assets and liabilities will be subject to a valuation allowance if adjusted).

As of March 31, 2018, the Company had an aggregate tax receivable of $1.8 million from various federal, state and local jurisdictions.

Deferred taxes reflect the tax effects of the differences between the amounts recorded as assets and liabilities for financial reporting purposes and the comparable amounts recorded for income tax purposes. Significant components of the deferred tax assets (liabilities) at March 31, 2018 and 2017 are as follows (in thousands):

	March 31, 2018	March 31, 2017
Deferred tax assets:		
Research tax credits	$ 8,757	$ 1,793
Other	293	937
Net operating loss	118,661	10,623
Share-based compensation	9,635	13,518
Subtotal	137,346	26,871
Valuation allowance	(137,211)	(24,141)
Deferred tax liabilities:		
Depreciation	(135)	(21)

Total deferred tax assets	$—	$2,709

The Company has net operating losses in the United States, Switzerland and the United Kingdom in the amounts of $2.1 million, $1,063.8 million and $6.3 million, respectively. The United States federal NOL can be carried forward indefinitely with an annual limitation on utilization. The Switzerland NOL will begin to expire as of March 31, 2025. The UK NOL can be carried forward indefinitely with an annual limitation on utilization. In addition, the Company has United States research and development credit carryforwards in the amount of $8.8 million which will begin to expire as of March 31, 2026.

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The Company assesses the realizability of the deferred tax assets at each balance sheet date based on available positive and negative evidence in order to determine the amount which is more likely than not to be realized and record a valuation allowance as necessary. Due to the Company's cumulative loss position which provides significant negative evidence difficult to overcome, the Company has recorded a valuation allowance of $137.2 million as of March 31, 2018, representing the portion of the deferred tax asset that is not more likely than not to be realized. The amount of the deferred tax asset considered realizable could be adjusted for future factors that would impact the assessment of the objective and subjective evidence of the Company. The Company will continue to assess the realizability of deferred tax assets at each balance sheet date in order to determine the proper amount, if any, required for a valuation allowance.

There are outside basis differences related to the Company's investment in subsidiaries for which no deferred taxes have been recorded as these would not be subject to tax on repatriation as Bermuda has no tax regime for Bermuda exempted limited companies, and the UK tax regime relating to company distributions generally provides for exemption from tax for most overseas profits, subject to certain exceptions.

The Company is subject to tax and will file income tax returns in the United Kingdom, Switzerland, and the United States federal and United States state and local jurisdictions. The Company is subject to tax examinations for tax years ended March 31, 2015 and forward in all applicable income tax jurisdictions. Tax audits and examinations can involve complex issues, interpretations and judgments. The resolution of matters may span multiple years particularly if subject to litigation or negotiation. The Company believes it has appropriately recorded its tax position using reasonable estimates and assumptions, however the potential tax benefits may impact the results of operations or cash flows in the period of resolution, settlement or when the statutes of limitations expire. There are no uncertain tax benefits recorded as of March 31, 2018.

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Note 10—Commitments and Contingencies

The Company has entered into commitments under a development, marketing and supply agreement with Arena (See Note 3 (A)), an amended Services Agreement with RSI (See Note 6 (A)), a separate services agreement with RSG (See Note 6 (A)), a license agreement with Qaam (See Note 3 (C)) and agreements with third parties for office space. In addition, the Company has entered into services agreements with third parties for pharmaceutical manufacturing and research activities. The manufacturing agreements can be terminated by the Company with 30 days written notice. The Company expects to enter into other commitments as its business further develops.

In June 2017, the Company entered directly into a license agreement with a third party for approximately 19,554 square feet of office space in New York, New York. This license agreement will expire in January 2019. For the year ended March 31, 2018, the Company incurred $1.2 million in rent expense under this license agreement. ASA is leasing 955 square feet of office space in Princeton, New Jersey under a lease agreement expiring in August 2020. During the year ended March 31, 2016, the Company entered into two subleases with RSI for office space in New York, NY. Under the terms of the subleases, RSI paid rent obligations directly pursuant to a master lease, and then invoiced the Company based on the Company's proportionate share of the space and overhead expenses, calculated based upon the relative numbers of full-time equivalent employees located on the premises. As a result, the Company's rent obligations were not fixed. For the years ended March 31, 2018, 2017 and 2016, the Company incurred $0.9 million, $1.2 million and $0.6 million, respectively, in rent expense under this arrangement with RSI. The Company ceased incurring rent expense under this arrangement with RSI after entering into the June 2017 license agreement for office space.

As of March 31, 2018, the Company did not have any ongoing material financial commitments, other than pursuant to the Arena Development Agreement, Loan Agreement and agreements to rent office space. Under the terms of the asset purchase agreement with GSK, the Company made a $5.0 million milestone payment in June 2016, which had been recorded as a contingent payment liability as of March 31, 2016.

The following table provides information with respect to contractual obligations as of March 31, 2018:

Contractual Obligations (in thousands)	Total	Under 1 year	1-3 years	3-5 years	Over 5 years
Long-term debt obligations	$55,000	$9,753	$45,247	$ —	$ —
Interest expense on long-term debt (1)	11,967	6,202	5,765	—	—
Rent obligations (2)	959	910	49	—	—
Total	$67,926	$16,865	$51,061	$ —	$ —

(1) estimated using interest rate in effect at March 31, 2018

(2) net of prepayments

Note 11—Selected Quarterly Financial Data (Unaudited)

The following table presents selected quarterly financial data for the years ended March 31, 2018 and March 31, 2017:

	First Quarter Ended June 30, 2017	Second Quarter Ended September 30, 2017	Third Quarter Ended December 31, 2017	Fourth Quarter Ended March 31, 2018	First Quarter Ended June 30, 2016	Second Quarter Ended September 30, 2016	Third Quarter Ended December 31, 2016	Fourth Quarter Ended March 31, 2017
Total operating expenses	$65,230	$68,667	$55,378	$24,043	$37,907	$41,523	$47,972	$53,097
Net loss	(69,266)	(69,086)	(57,902)	(25,319)	(38,055)	(42,252)	(47,811)	(52,833)
	(0.65)	(0.64)	(0.54)	(0.23)	(0.38)	(0.43)	(0.48)	(0.53)

Net loss per share attributable to common shareholders - basic and diluted	

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Note 12—Restructuring

In October 2017, the Company initiated and committed to the first of two corporate realignments to focus its efforts and resources on the Company's ongoing and future programs that included a reduction in its workforce and a transfer of certain employees to affiliates. The second realignment was initiated and committed to in February 2018.

As a result of the reduction in headcount, the Company incurred aggregate charges of approximately $6.0 million for one-time severance and related costs during the year ended March 31, 2018, all of which resulted from cash expenditures.

The impacted employees are eligible to receive severance payments in specified amounts, health benefits and outplacement services. The Company has recorded these charges in research and development and general and administrative expenses in the accompanying consolidated statements of operations based on responsibilities of the impacted employees.

	Balance as of April 1, 2017	Expenses, net	Cash	Noncash	Balance as of March 31, 2018
			(in thousands)		
Employee severance and other personnel benefits	$ —	$ 6,035	$ (3,575)	$ —	$ 2,460

Note 13—Subsequent Events

Oxford BioMedica License Agreement

On June 5, 2018, ASG entered into the Oxford BioMedica Agreement with Oxford BioMedica, pursuant to which the Company received a worldwide, exclusive, royalty-bearing, sub-licensable license under certain patents and other intellectual property controlled by Oxford BioMedica to develop and commercialize OXB-102 (now AXO-Lenti-PD) and related gene therapy products for all diseases and conditions. As partial consideration for the license, the Company will make an upfront payment to Oxford BioMedica of $30.0 million, $5.0 million of which will be applied as a credit against the process development work and clinical supply that Oxford BioMedica will provide to the Company. Under the terms of the Oxford BioMedica Agreement, the Company could be obligated to make payments to Oxford BioMedica totaling up to $55.0 million upon the achievement of specified development milestones and $757.5 million upon the achievement of specified regulatory and sales milestones. The Company will also be obligated to pay Oxford BioMedica a tiered royalty from 7% to 10%, based on yearly aggregate net sales of the Gene Therapy Products, subject to specified reductions upon the occurrence of certain events as set forth in the Oxford BioMedica Agreement. These royalties are required to be paid, on a product-by-product and country-by-country basis, until the latest to occur of the expiration of the last to expire valid claim of a licensed patent covering such product in such country, the expiration of regulatory exclusivity for such product in such country, or 10 years after the first commercial sale of such product in such country.

The Company is solely responsible, at its expense, for all activities related to the development and commercialization of the Gene Therapy Products. Pursuant to the Oxford BioMedica Agreement, the Company is required to use commercially reasonable efforts to develop, obtain regulatory approval of, and commercialize a Gene Therapy Product in the United States and at least one major market country in Europe. In addition, the Company is required to meet certain diligence milestones and to include at least one U.S.-based clinical trial site in a pivotal study of a Gene Therapy Product. If the Company fails to meet any of these specified development milestones, it may cure such failure by paying Oxford BioMedica certain fees, which range from $0.5 million to $1.0 million.

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Roivant Financing

On June 5, 2018, the Company entered into a share purchase agreement (the "Purchase Agreement") with RSL, our majority shareholder, pursuant to which the Company agreed to issue and sell to RSL 14,285,714 of its common shares at a purchase price of $1.75 per common share in a private placement (the "Private Placement"), equal to the per share closing price of the Company's common shares on the Nasdaq Global Select Market on June 5, 2018. The Purchase Agreement includes customary representations, warranties and covenants. Closing of the Private Placement is subject to satisfaction or waiver of customary closing conditions, including the lapse of a 20-day period following the mailing by the Company of an information statement relating to the Private Placement to its shareholders. As of March 31, 2018, RSL held 69.6% of the Company's outstanding common shares. The aggregate gross proceeds to the Company from the Private Placement are expected to be approximately $25.0 million. The Company intends to use the net proceeds from the Private Placement to fund the clinical development of AXO-Lenti-PD as well as additional business development activities, for working capital and other general corporate purposes. The Company's common shares issued and sold in the Private Placement will not be registered under the Securities Act or any state securities laws and may not be sold, offered for sale, pledged or hypothecated in the absence of a registration statement in effect with respect to the Company's common shares under the Securities Act or an applicable exemption from the registration requirements.

Amended and Restated Information Sharing and Cooperation Agreement

On June 5, 2018, in connection with the Private Placement, the Company entered into an amended and restated information sharing and cooperation agreement (the "Restated Cooperation Agreement") with RSL, which will become effective as of the closing date of the Private Placement. The Restated Cooperation Agreement, among other things: (1) obligates the Company to deliver to RSL periodic financial statements and other information upon reasonable request and to comply with other specified financial reporting requirements; (2) requires the Company to supply certain material information to RSL to assist it in preparing any future SEC filings; and (3) requires the Company to implement and observe certain policies and procedures related to applicable laws and regulations. The Company agreed to indemnify RSL and its affiliates and their respective officers, employees and directors against all losses arising out of, due to or in connection with RSL's status as a shareholder under the Restated Cooperation Agreement and the operations of or services provided by RSL or its affiliates or their respective officers, employees or directors to the Company or any of its subsidiaries, subject to certain limitations set forth in the Restated Cooperation Agreement.

Subject to specified exceptions, the Restated Cooperation Agreement will terminate at such time as RSL is no longer required (a) under U.S. GAAP to consolidate the Company's results of operations and financial position, (b) under U.S. GAAP to account for its investment in the Company under the equity method of accounting, or (c) otherwise to include separate financial statements of the Company in its filings with the SEC pursuant to any SEC rule. In addition, the Cooperation Agreement may be terminated upon mutual written consent of the parties or upon written notice from RSL to the Company in the event of the Company's bankruptcy, liquidation, dissolution or winding-up.