UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

Form 10-K

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

For the Fiscal Year Ended December 31, 2018

or

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: 001-34949

Arbutus Biopharma Corporation

(Exact Name of Registrant as Specified in Its Charter)

British Columbia, Canada	**98-0597776**
(State or Other Jurisdiction of Incorporation or Organization)	(I.R.S. Employer Identification No.)

100-8900 Glenlyon Parkway, Burnaby, BC V5J 5J8
(Address of Principal Executive Offices)

604-419-3200
(Registrant's Telephone Number, Including Area Code):

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

Title of Each Class	**Name of Each Exchange on Which Registered**
Common shares, without par value	The Nasdaq Stock Market LLC

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

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

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

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 x No o

Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T during the preceding 12 months (or for such shorter period that the registrant was required to submit such files). Yes x 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. o

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a smaller reporting company, or an "emerging growth company". See the definitions of "large accelerated filer," "accelerated filer," "smaller reporting company," and emerging growth company" in Rule 12b-2 of the Exchange Act.

Large accelerated filer o	Accelerated filer x
Non-accelerated filer o	Smaller reporting company x
Emerging growth company o	

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

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Act). Yes o No x

As of June 30, 2018, the last business day of the registrant's most recently completed second fiscal quarter, the approximate aggregate market value of voting and non-voting common equity held by non-affiliates of the registrant was $269,738,700 (based on the closing price of $7.30 per share as reported on the NASDAQ Global Select Market as of that date).

As of March 5, 2019, the registrant had 56,120,868 common shares, no par value, outstanding. In addition, the registrant had outstanding 1,164,000 convertible preferred shares, which will be mandatorily converted into 22,589,601 common shares on October 18, 2021. Assuming the convertible preferred shares were converted as of March 5, 2019, the registrant would have had 78,710,469 common shares outstanding at March 5, 2019.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the registrant's definitive proxy statement for its 2019 Annual Meeting of Stockholders, which the registrant intends to file pursuant to Regulation 14A with the Securities and Exchange Commission not later than 120 days after the registrant's fiscal year end of December 31, 2018, are incorporated by reference into Part III of this Form 10-K.

ARBUTUS BIOPHARMA CORPORATION

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Cautionary Note Regarding Forward-looking Statements

This Annual Report on Form 10-K (this "Form 10-K") contains "forward-looking statements" or "forward-looking information" within the meaning of applicable U.S. and Canadian securities laws (we collectively refer to these items as "forward-looking statements"). Forward-looking statements are generally identifiable by use of the words "believes," "may," "plans," "will," "anticipates," "intends," "budgets," "could," "estimates," "expects," "forecasts," "projects" and similar expressions that are not based on historical fact or that are predictions of or indicate future events and trends, and the negative of such expressions. Forward-looking statements in this Form 10-K, including the documents incorporated by reference, include statements about, among other things:

- our strategy, future operations, pre-clinical research, pre-clinical studies, clinical trials, prospects and the plans of management;
- the discovery, development and commercialization of a cure for chronic hepatitis B infection, a disease of the liver caused by the hepatitis B virus ("HBV");
- our beliefs and development path and strategy to achieve a cure for HBV;
- obtaining necessary regulatory approvals;
- obtaining adequate financing through a combination of financing activities and operations;
- using the results from our HBV studies to adaptively design additional clinical trials to test the efficacy of the combination therapy and the duration of the result in patients;
- the payment of one-time employee termination benefits, employee relocation costs, and site closure costs, totaling approximately $5,600,000 related to the site consolidation and organizational restructuring to align our HBV business in Warminster, PA;
- the expected timing of and amount for payments related to the Enantigen Therapeutics, Inc.'s transaction and its programs;
- the potential of our drug candidates to improve upon the standard of care and contribute to a curative combination treatment regimen;
- the potential for our royalty entitlement on Onpattro™ (Patisiran) to provide an active royalty stream or to be otherwise monetized in full or part;
- developing a suite of products that intervene at different points in the viral life cycle, with the potential to reactivate the host immune system;
- using pre-clinical results to adaptively design clinical trials for additional cohorts of patients, testing the combination and the duration of therapy;
- selecting combination therapy regimens and treatment durations to conduct Phase 3 clinical trials intended to ultimately support regulatory filings for marketing approval;
- expanding our HBV drug candidate pipeline through internal development, acquisitions and in-licenses;
- the potential of our assets, including our ownership stake in Genevant Sciences Ltd. and our royalty entitlement on Onpattro, to provide significant non-dilutive capital;
- continuing to focus on rapidly advancing AB-506, with top-line results expected in the second quarter of 2019;
- our expectation to initiate a Phase 2 clinical study of AB-506 in the fourth quarter of 2019;
- the potential of AB-506 to be a 'best-in-class' capsid inhibitor with once-daily dosing;
- our expectation to make a decision regarding AB-452 clinical development in the second half of 2019;
- the development of a second-generation RNAi agent, AB-729, and its expected progression into clinical trials in the second quarter of 2019 and the potential to subsequently combine it with AB-506 in the first half of 2020;
- a potential IND/CTA filing for AB-729, with clinical trials in the first half of 2019;
- our expectation to initiate HBV patient dosing on AB-729 in the second half of 2019;
- our expectation to provide an RNA destabilizer program update in the second half of 2019;
- payments from the Gritstone Oncology, Inc. licensing agreement;
- the expectation for organizational changes to result in increased efficiency, a more flexible variable cost structure, and additional preservation of our cash reserves;

- the belief that current legal proceedings will not have a material adverse effect on our consolidated results of operations, cash flows, or financial condition;
- the expected return from strategic alliances, licensing agreements, and research collaborations;
- statements with respect to revenue and expense fluctuation and guidance;
- having sufficient cash resources to fund our operations into 2020;
- obtaining funding to maintain and advance our business from a variety of sources including public or private equity or debt financing, collaborative arrangements with pharmaceutical companies, other non-dilutive commercial arrangements and government grants and contracts;
- on-going arbitration and litigation proceedings; and
- the amount and timing of potential funding

as well as other statements relating to our future operations, financial performance or financial condition, prospects or other future events. Forward-looking statements appear primarily in the sections of this Form 10-K entitled “Item 1-Business,” “Item 1A-Risk Factors,” “Item 7-Management’s Discussion and Analysis of Financial Condition and Results of Operations,” “Item 7A-Quantitative and Qualitative Disclosures About Market Risk,” and “Item 8-Financial Statements and Supplementary Data.”

Forward-looking statements are based upon current expectations and assumptions and are subject to a number of known and unknown risks, uncertainties and other factors that could cause actual results to differ materially and adversely from those expressed or implied by such statements. Factors that could cause or contribute to such differences include, but are not limited to, those discussed in this Form 10-K and in particular the risks and uncertainties discussed under "Item 1A-Risk Factors" of this Form 10-K. As a result, you should not place undue reliance on forward-looking statements.

Additionally, the forward-looking statements contained in this Form 10-K represent our views only as of the date of this Form 10-K (or any earlier date indicated in such statement). While we may update certain forward-looking statements from time to time, we specifically disclaim any obligation to do so, even if new information becomes available in the future. However, you are advised to consult any further disclosures we make on related subjects in the periodic and current reports that we file with the Securities and Exchange Commission.

The foregoing cautionary statements are intended to qualify all forward-looking statements wherever they may appear in this Form 10-K. For all forward-looking statements, we claim protection of the safe harbor for the forward-looking statements contained in the Private Securities Litigation Reform Act of 1995.

This Form 10-K also contains estimates, projections and other information concerning our industry, our business, and the markets for certain diseases, including data regarding the estimated size of those markets, and the incidence and prevalence of certain medical conditions. Information that is based on estimates, forecasts, projections, market research or similar methodologies is inherently subject to uncertainties and actual events or circumstances may differ materially from events and circumstances reflected in this information. Unless otherwise expressly stated, we obtained this industry, business, market and other data from reports, research surveys, studies and similar data prepared by market research firms and other third parties, industry, medical and general publications, government data and similar sources.

PART I

1. Business Overview

Arbutus Biopharma Corporation ("Arbutus", the "Company", "we", "us", and "our") is a publicly traded (Nasdaq Global Select Market: ABUS) industry-leading therapeutic solutions company dedicated to discovering, developing, and commercializing a cure for patients suffering from chronic hepatitis B infection, a disease of the liver caused by the hepatitis B virus (“HBV”). HBV represents a significant, global unmet medical need. The World Health Organization estimates that 257 million people worldwide suffer from HBV infection, while other estimates indicate that approximately 2 million people in the United States suffer from HBV infection. With high morbidity and mortality, and a cure rate for HBV patients taking standard of care ("SOC") treatment regimens of less than 5%, our objective is to develop safe and effective therapies that can be combined and lead to higher cure rates with finite treatment durations.

To pursue our strategy of developing a potential curative combination regimen for chronic HBV, we are developing a diverse product pipeline consisting of multiple drug candidates with complementary mechanisms of action ("MOA"), each of which has the potential to improve upon the SOC and contribute to a curative combination treatment regimen. Our pipeline includes agents that have the potential to form an effective proprietary combination therapy.

In addition to our drug pipeline focused on HBV, we have additional assets that have the potential to provide value to our company. The first is our royalty entitlement on Onpattro™ (Patisiran), a drug developed by Alnylam Pharmaceutical, Inc. ("Alnylam") that incorporates our our lipid nanoparticle delivery ("LNP") technology and was approved by the U.S. Food and Drug Administration ("FDA") and the European Medicines Agency (“EMA”) during the third quarter of 2018. This royalty entitlement has the potential to provide an active royalty stream or to be otherwise monetized in full or in part. The second is our approximate 40% equity ownership interest in Genevant Sciences Ltd. ("Genevant"), a newly created company to which we have licensed our LNP platform and conjugate delivery platform (the "Delivery Platforms") for all applications except HBV. These additional assets have the potential to provide significant non-dilutive capital to fund development of our HBV pipeline.

Strategy

Our objective is to develop a cure for patients with chronic HBV infection. We believe this can best be achieved by:

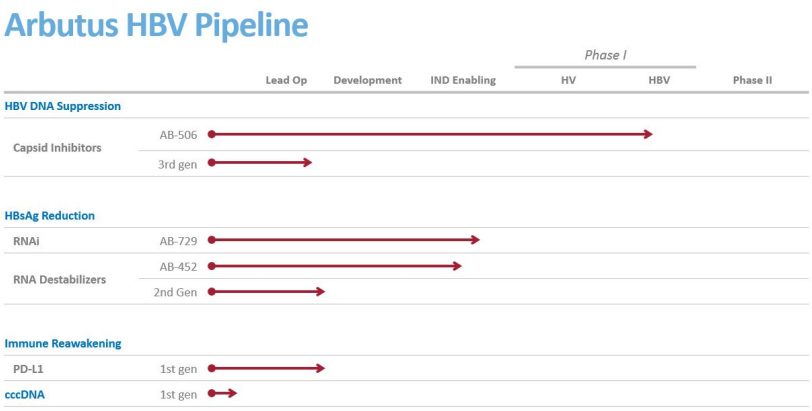
- developing a pipeline of proprietary therapeutic agents that target multiple elements of the HBV viral lifecycle, the most important of which we believe are HBV replication, hepatitis B surface antigen ("HBsAg") expression and immune reactivation; and
- identifying an effective combination of complementary proprietary therapeutic agents administered for a finite treatment duration.

Our primary focus is to:

- progress our clinical and pre-clinical product candidates through Phase 1 and Phase 2 clinical trials;
- identify a safe and effective combination regimen to support a robust Phase 3 clinical registration program;
- obtain regulatory approval for such combination regimen; and
- commercialize such combination regimen.

We are currently conducting a Phase 1a/1b clinical trial and several pre-clinical and investigational new drug ("IND")-enabling studies to evaluate proprietary HBV therapeutic agents alone, together with SOC therapies and in combination with each other. We expect to use the results from the clinical trial and other studies to adaptively design future clinical trials to test the safety, efficacy and duration of potential combination therapies.

Our HBV product pipeline consists of the following programs:



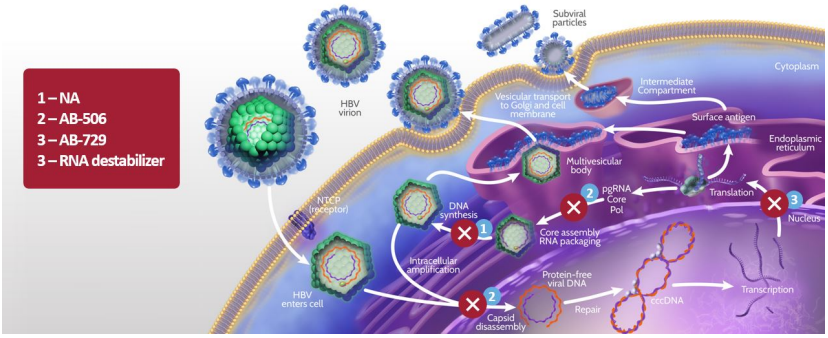
We intend to expand our HBV pipeline through internal discovery and development and possibly acquisitions and in-licenses.

HBV Background

Agents for Combination Therapy

Current treatments for HBV include pegylated interferon-á ("Peg-IFNá") and nucleos(t)ide analogues ("NAs"). These treatments reduce viral load, but have low cure rates of less than 5%. Peg-IFNá, a synthetic version of a substance produced by the body to fight infection, is administered by injection and has numerous side effects including flu-like symptoms and depression. NAs are oral antiviral medications which when taken chronically reduce virus replication and eliminate HBV DNA in the blood. However, liver inflammation and fibrosis still develop and virus replication resumes once NA therapy is stopped.

Given the biology of HBV (as shown in the graphic below), we believe combination therapies are the key to more effective HBV treatment and a potential cure. Additionally, we believe the development of an effective combination therapy can be accelerated when multiple components are controlled by a single company. Therefore, our R&D pipeline includes multiple drug candidates that target various steps in the viral lifecycle. We believe each of these mechanisms, when combined with an approved NA, have the potential to improve upon the standard of care and contribute to a curative treatment regimen and a finite treatment duration.



1. Nucleos(t)ide analogues (NAs): NAs work by inhibiting HBV DNA polymerase activity and suppressing HBV replication. Oral NAs have become a mainstay of HBV treatment, mainly due to their ability to drive viral load to undetectable levels in the serum of patients, easy single pill once-a-day dosing and lack of significant side effects. However, NAs cure only a small percentage of patients and typically require chronic dosing to maintain their benefits, which can be challenging for patients.

2. Capsid inhibitor (AB-506): this orally available product candidate inhibits HBV replication by destabilizing core particle assembly or disassembly through either promoting the assembly of empty capsids or causing core protein to form aberrant polymers. We believe the combination of a capsid inhibitor with an approved NA and a RNA interference ("RNAi") agent targeting HBVsAg has the potential to lead to important clinical benefits including more effective suppression of viral replication in the serum and, more importantly, in the liver, driving significantly higher cure rates with shortened treatment durations.

3. RNAi (AB-729): this subcutaneously-delivered agent targets a single RNAi trigger sequence that spans all of the HBV transcripts and reduces all of the viral antigens, including hepatitis B surface antigen (HBsAg), which is believed to be involved in immune exhaustion in patients with chronic HBV. We believe the combination of an approved NA, a RNAi agent and a capsid inhibitor, has the potential to lead to important clinical benefits including more effective suppression of viral replication, significantly higher functional cure rates and shortened treatment durations.

RNA destabilizer (AB-452): this orally available product candidate acts via a novel RNA destabilizing mechanism which reduces all viral proteins and antigens, including HBsAg. RNA destabilizers have the potential to complement or replace subcutaneously delivered RNAi agents with an oral therapy.We believe this novel mechanism represents a very relevant and important therapeutic target which, when used in combination with a capsid inhibitor and an approved NA will lead to important clinical outcomes including more effective suppression of viral replication, significantly higher functional cure rates and shortened treatment durations.

Based upon the mechanisms described above, we believe that our RNAi agent, AB-729, could be combined with our capsid inhibitor, AB-506, and approved NAs, in our first combination therapy for HBV patients. Provided the initial clinical trials for AB-506 and AB-729 proceed as expected, we anticipate initiating combination clinical trials with these two agents, and an approved NA, in the first half of 2020. In parallel, we are advancing our RNA destabilizer program forward. This program includes AB-452 and several follow-on compounds from distinct chemical scaffolds. We anticipate providing an update to the RNA destabilizer program in the second half of 2019.

HBV Suppression

Capsid Inhibitors (AB-506 & AB-423)

HBV core protein assembles into a capsid structure, which is required for viral replication. The current SOC therapy (nucleoside analogues) significantly reduces HBV DNA levels in the serum, but HBV replication continues in the liver, thereby enabling HBV infection to persist. More effective therapy for patients requires new agents which will further block viral replication. We are developing capsid inhibitors (also known as core protein inhibitors) as oral therapeutics which, in combination with nucleoside analog therapy, could sufficiently block HBV replication for the treatment of chronic HBV infection. By inhibiting assembly of functional viral capsids, the ability of HBV to replicate is impaired. Capsid inhibitor molecules also inhibit the uncoating step of the viral life cycle and thus reduce the formation of new covalently closed circular DNA ("cccDNA"), the viral reservoir which resides in the cell nucleus.

Our capsid inhibitor discovery effort generated promising second generation compounds in 2017, which led to the nomination of AB-506 for IND/clinical trial authorization ("CTA")-enabling studies. AB-506 is an orally administered, highly selective capsid inhibitor that has shown improved potency and pharmacokinetics (“PK”) over our first generation capsid inhibitor, AB-423, in pre-clinical studies. We presented AB-506 pre-clinical data at the American Association for the Study of Liver Disease ("AASLD") annual meeting in October 2017 in a presentation titled, "Antiviral Characterization of a Next Generation Chemical Series of HBV Capsid Inhibitors In Vitro and In Vivo," which showed potent inhibition of HBV replication and pre-genomic RNA encapsidation and an accelerated rate of capsid assembly leading to the production of non-functional viral capsids, which results in a disruption of viral replication. Together, these factors indicate improved target engagement compared to first generation capsid inhibitors, including AB-423.

We received regulatory approval of our CTA for AB-506 in the second quarter of 2018. During the third quarter of 2018, AB-506 progressed through the healthy volunteer portion of a multi-component phase 1a/1b clinical trial in which it was demonstrated to be generally safe and well-tolerated after dosing. In October 2018, AB-506 entered the 28-day HBV patient portion of the trial, where it is being evaluated alone and may be studied in combination with a NA. Top-line results of the phase 1a/1b clinical trial are expected late in the second quarter of 2019 with full results presented later in the year at an appropriate scientific meeting. We also plan to initiate a Phase 2 clinical trial combining AB-506 and an NA in the second half of 2019 to establish long-term safety of AB-506 plus and NA to support use of these in future combination trials.

AB-423 was our first-generation capsid inhibitor candidate, which was evaluated in a Phase 1a Single Ascending Dose and Multiple Ascending Dose trial designed to assess the safety, tolerability, and PK after oral administration in healthy volunteers. AB-423 was well-tolerated with no serious adverse events.

Given the successful progression of AB-506 through clinical testing into patients, we have indefinitely deferred further development of AB-423.

HBsAg Reduction

RNAi Agents

The development of RNAi drugs, which utilize the RNA interference pathway, allows for a novel approach to treating disease. There are a number of RNAi products currently advancing in human clinical trials. RNAi products are broadly applicable as they can eliminate the production of disease-causing or disease-associated proteins from cells, creating opportunities for therapeutic intervention that have not been achievable with conventional drugs. Our extensive experience in antiviral drug development has been applied to our RNAi program to develop therapeutics for chronic HBV infection.

Our RNAi HBV candidates are designed to reduce HBsAg expression in patients chronically infected with HBV. Reducing HBsAg is thought to be a key prerequisite to enable a patient’s immune system to reawaken and respond against the virus. Our initial RNAi candidate, ARB-1467, demonstrated the ability to reduce HBsAg in patients but utilized a lipid nanoparticle delivery vehicle which required intravenous delivery and bi-weekly administration. We have discontinued development of ARB-1467 and are focused on AB-729, a new RNAi agent. AB-729 reduces HBsAg, is administered subcutaneously, and we anticipate will be dosed monthly.

GalNAc RNAi (AB-729)

Early in 2018, we nominated AB-729 for development. AB-729 is a second generation RNAi therapeutic targeted to hepatocytes using our novel covalently conjugated N-acetylgalactosamine ("GalNAc") delivery technology that enables subcutaneous delivery. This promising new agent acts on multiple HBV viral transcripts and was designed to inhibit viral replication and suppress all viral antigens.

We presented data from pre-clinical studies at the International Liver Congress of the European Association for the Study of the Liver (“EASL”) meeting in April 2018 in a presentation titled, “Durable Inhibition of Hepatitis B Virus Replication and Antigenemia Using Subcutaneously Administered siRNA Agent AB-729 in Preclinical Models”, which showed robust HBsAg knockdown and more durable in vivo activity than earlier-generation siRNA agents, including ARB-1467, for the treatment of chronic HBV infection.

We are completing IND/CTA-enabling studies, and pending success of those studies and a subsequent regulatory filing, anticipate entering clinical trials with AB-729 in the second quarter of 2019 and progress into HBV patients in the second half of the year.

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HBV RNA Destabilizer (AB-452)

HBV RNA destabilizer AB-452, an orally administered agent, has shown novel and broad activity in pre-clinical studies in destabilizing HBV RNA, which leads to RNA degradation, which leads to reduction in HBsAg levels. We presented these preclinical data at the AASLD annual meeting in October 2017 in a presentation titled, "Identification and Characterization of AB-452, a Potent Small Molecule HBV RNA destabilizer In Vitro and In Vivo," which showed that AB-452 has complementary effects when combined with two of Arbutus’ proprietary HBV RNAi agents in vitro.

Additional data was presented at the EASL meeting in April 2018 in a presentation titled, “Preclinical antiviral drug combination studies utilizing novel orally bioavailable agents for chronic hepatitis B infection: AB-506, a next generation HBV capsid inhibitor, and AB-452, an HBV RNA destabilizer,” which showed that in vivo combinations of AB-452, AB-506 and tenofovir, an NA, led to greater reductions in serum HBV DNA relative to monotherapy with the individual compounds, and an impact on HBsAg when AB-452 was included in the treatment regimen. At the International HBV Meeting in October 2018, in a presentation titled “Mode of Action Studies on HBV RNA Destabilizer AB-452,” we presented data that showed that the HBV post-regulatory element is essential to AB-452 activity and that AB-452 induces HBV RNA shortening and RNA body degradation, further elucidating the mechanism of action of AB-452. This molecule has the potential for once daily, oral dosing.

In October 2018, we announced that we became aware of emerging nonclinical safety findings in the AB-452 RNA destabilizer program. Given the nature of these observations and the novel mechanism of action of this drug, we felt a sufficient amount of time must be allocated to understanding these findings and their implications before potentially commencing a clinical study of AB-452. Given these observations, we are also continuing to advance back-up compounds, which are now in the lead optimization stage. This decision does not alter our commitment to the RNA destabilizer mechanism, and while we work to fully understand the nature of the AB-452 pre-clinical findings, we are advancing several follow-on compounds with distinct chemical scaffolds.

Research Programs

In addition to our clinical candidates, we have a number of research programs aimed at discovery and development of proprietary HBV candidates with different and complementary mechanisms of action. We have ongoing discovery efforts focused on checkpoint inhibition and cccDNA targeting and to identify novel, orally administered small molecule drug candidates to complement our pipeline of agents to form an effective combination therapy for the treatment of HBV.

Strategic Alliances, Licensing Agreements, and Research Collaborations

Onpattro® (Patisiran/ALN-TTR02)

In 2012, we entered into a license agreement with Alnylam that entitles Alnylam to develop and commercialize products with our LNP technology. Alnylam's Onpattro (Patisiran/ALN-TTR02) program, which represents the most clinically advanced application of our LNP technology, was approved by the FDA and European Medicines Agency ("EMA") during the third quarter of 2018 and was launched immediately upon approval in the US. We are entitled to tiered low to mid single-digit royalty payments on net sales of Onpattro and received our first royalty payment in the fourth quarter of 2018.

Genevant Sciences

In April 2018, we entered into an agreement with Roivant Sciences Ltd. (“Roivant”), our largest shareholder, to launch Genevant, a company focused on the discovery, development, and commercialization of a broad range of RNA-based therapeutics enabled by our LNP and ligand conjugate delivery technologies. We have licensed exclusive rights to our LNP and ligand conjugate delivery platforms to Genevant for RNA-based applications outside of HBV. Genevant plans to develop products in-house and pursue industry partnerships to build a diverse pipeline of therapeutics across multiple modalities, including RNAi, mRNA, and gene editing.

Under the terms of the agreement, Roivant contributed $37.5 million in transaction-related seed capital to Genevant, consisting of an initial $22.5 million investment and a subsequent investment of $15 million at a pre-determined, stepped-up valuation. We retain all rights to our LNP and conjugate delivery platforms for HBV, and are entitled to a tiered low single-digit royalty from Genevant on future sales of products enabled by the delivery platforms licensed to Genevant. We also retained the entirety of our royalty entitlement on the commercialization of Alnylam’s Onpattro. As of December 31, 2018, we held an equity interest in Genevant of approximately 40%.

The Baruch S. Blumberg Institute and Drexel University

In February 2014, Arbutus Biopharma Inc. (“Arbutus Inc.”), our wholly owned subsidiary, entered into a license agreement with The Baruch S. Blumberg Institute (“Blumberg”) and Drexel University (“Drexel”) that granted an exclusive (except as to certain know-how and subject to retained non-commercial research rights), worldwide, sub-licensable license to three different compound series: cccDNA formation inhibitors, capsid assembly inhibitors and hepatocellular carcinoma inhibitors. During 2018, we returned rights to the cccDNA formation inhibitors and hepatocellular carcinoma inhibitors to Blumberg.

As partial consideration for this license, Arbutus Inc. paid a license initiation fee of $150,000 and issued warrants to Blumberg and Drexel. The warrants were subsequently exercised in 2014. Under this license agreement, Arbutus Inc. also agreed to pay up to $3.5 million in development and regulatory milestones per licensed compound series, up to $92.5 million in sales performance milestones per licensed product, and royalties in the mid-single digits based upon the proportionate net sales of licensed products in any commercialized combination. We are obligated to pay Blumberg and Drexel a double-digit percentage of all amounts received from the sub-licensees, subject to customary exclusions.

In November 2014, Arbutus Inc. entered into an additional license agreement with Blumberg and Drexel pursuant to which it received an exclusive (subject to retained non-commercial research rights), worldwide, sub-licensable license under specified patents and know-how controlled by Blumberg and Drexel covering epigenetic modifiers of cccDNA and stimulator of interferon genes (“STING”) agonists. During 2018, we returned rights to the epigenetic modifiers of cccDNA and STING agonists to Blumberg. In consideration for these exclusive licenses, Arbutus Inc. made an upfront payment of $50,000. Under this agreement, we will be required to pay up to $1.0 million for each licensed product upon the achievement of a specified regulatory milestone and a low-single-digit royalty based upon the proportionate net sales of compounds covered by this intellectual property in any commercialized combination. We are also obligated to pay Blumberg and Drexel a double-digit percentage of all amounts received from our sub-licensees, subject to exclusions.

License Agreements between Enantigen and Blumberg and Drexel

In October 2014, Arbutus Inc. acquired all of the outstanding shares of Enantigen Therapeutics, Inc. (“Enantigen”) pursuant to a stock purchase agreement. Through this transaction, Arbutus Inc. acquired a HBV surface antigen secretion inhibitor program and a capsid assembly inhibitor program.

Under the stock purchase agreement, we agreed to pay up to a total of $21.0 million to Enantigen’s selling shareholders upon the achievement of specified development and regulatory milestones for (a) the first two products that contain either a capsid compound or an HBV surface antigen compound that is covered by a patent acquired under this agreement, or (b) a capsid compound from an agreed upon list of compounds. The amount paid could be up to an additional $102.5 million in sales performance milestones in connection with the sale of the first commercialized product by us for the treatment of HBV, regardless of whether such product is based upon assets acquired under this agreement, and a low single-digit royalty on net sales of such first commercialized HBV product, up to a maximum royalty payment of $1.0 million that, if paid, would be offset against our milestone payment obligations. Refer to note 3 - Fair Value Measurements in the Notes to the Consolidated Financial Statements.

Under the stock purchase agreement, Enantigen must also fulfill its obligations as they relate to the three patent license agreements with Blumberg and Drexel. Pursuant to each patent license agreement, Enantigen is obligated to pay Blumberg and Drexel up to approximately $500,000 in development and regulatory milestones per licensed product, royalties in the low single-digits, and a percentage of revenue it receives from its sub-licensees.

Research Collaboration and Funding Agreement with Blumberg

In October 2014, Arbutus Inc. entered into a research collaboration and funding agreement with Blumberg under which we provided $1,000,000 per year of research funding for three years, renewable at our option for an additional three years, for Blumberg to conduct research projects in HBV and liver cancer. Blumberg has exclusivity obligations to us with respect to HBV research funded under the agreement. In addition, we have the right to match any third party offer to fund HBV research that falls outside the scope of the research being funded under the agreement. Blumberg has granted us the right to obtain an exclusive, royalty-bearing, worldwide license to any intellectual property generated by any funded research project. If we elect to exercise the right to obtain such a license, we will have a specified period of time to negotiate and enter into a mutually agreeable license agreement with Blumberg. This license agreement will include the following pre-negotiated upfront, milestone, and royalty payments: an upfront payment in the amount of $100,000; up to $8,100,000 upon the achievement of specified development and regulatory milestones; up to $92,500,000 upon the achievement of specified commercialization milestones; and royalties at a low-single to mid-single digit rates based upon the proportionate net sales of licensed products from any commercialized combination.

In June 2016, we entered into an amended and restated research collaboration and funding agreement with Blumberg, primarily to: (i) increase the annual funding amount to Blumberg from $1,000,000 to $1,100,000; (ii) extend the initial term through to October 29, 2018; (iii) provide an option for us to extend the term past October 29, 2018 for two additional one year terms; and (iv) expand our exclusive license under the agreement to include the sole and exclusive right to obtain and exclusive, royalty-bearing, worldwide, and all-fields license under Blumberg's rights in certain other inventions described in the agreement. The amended agreement expired in October 2018, at the end of its initial term.

In November 2018, we entered into a new two-year master services agreement with Blumberg that expires in November 2020. The new agreement replaces all rights and obligations of the prior research collaboration and funding agreements, as amended. Under the new agreement, Blumberg will perform specific research activities based upon statements of work and we will no longer provide a fixed amount of funding to Blumberg. In November and December 2018, we executed statements of work with Blumberg for an aggregate cost of $750,000. Intellectual property that is generated during the research activities is our exclusive property and all financial obligations for us to utilize the intellectual property are satisfied in the upfront cost of the research activities. Under the terms of the new agreement, we retain all rights to any inventions arising from performance of the agreement and no license is granted to Blumberg and Drexel, nor are milestones for said inventions due to Blumberg and Drexel.

Marqibo®

Marqibo®, originally developed by us, is a novel, sphingomyelin/cholesterol liposome-encapsulated formulation of the FDA-approved anticancer drug vincristine. Marqibo’s approved indication is for the treatment of adult patients with Philadelphia chromosome-negative acute lymphoblastic leukemia (Ph-ALL) in second or greater relapse or whose disease has progressed following two or more lines of anti-leukemia therapy. We originally out-licensed Marqibo to Talon Therapeutics Inc. (“Talon”) in 2006, and in July 2013, Talon was acquired by Spectrum Pharmaceuticals, Inc. (“Spectrum”). In September 2013, we announced that Spectrum had launched Marqibo through its existing hematology sales force in the United States. Since then commercial sales have occurred. We receive mid-single-digit royalty payments based on Marqibo’s commercial sales. In addition, Spectrum has ongoing trials evaluating Marqibo in two additional indications, which are Pediatric acute lymphoblastic leukemia and Non-Hodgkin’s lymphoma.

Gritstone Oncology

In October 2017, we entered into an exclusive license agreement with Gritstone Oncology, Inc. ("Gritstone"), that granted them worldwide access to our portfolio of proprietary and clinically validated LNP technology and associated intellectual property to deliver Gritstone’s self-replicating, non-mRNA, RNA-based neoantigen immunotherapy products. Gritstone paid us an upfront payment, and will make payments for achievement of development, regulatory, and commercial milestones, royalties, and will reimburse us for conducting technology development and providing manufacturing and regulatory support for Gritstone’s product candidates.

Acuitas Therapeutics Inc.

On November 12, 2012, we entered into a settlement agreement and general release (the “Settlement Agreement”) with our subsidiary Protiva Biotherapeutics, Inc. (“Protiva”), Alnylam and AlCana Technologies, Inc. to resolve our previous litigation with Alnylam and Acuitas Therapeutics Inc. (“Acuitas”). Consistent with the terms of the settlement agreement, we finalized and entered a cross-license agreement with Acuitas in December 2013. The terms of the cross-license agreement provide Acuitas with access to certain of our earlier IP generated prior to mid-April 2010 in the fields of gene replacement therapy and antisense. Acuitas may only grant access to our LNP technology to its partners if it is part of a product sublicense. At the same time, the terms provide us with certain access to Acuitas’ technology and licenses in the RNAi field, along with a percentage of each milestone and royalty payment with respect to certain products. Acuitas has agreed that it would not compete in the RNAi field for a period of five years, which ended in November 2017. Arbutus considered Acuitas to be in material breach of their cross-license agreement and in February 2018, Arbutus and Acuitas reached a settlement terminating Acuitas’ right to further use or sublicense Arbutus' LNP technology. Please refer to "Item 3. Legal Proceedings" for additional information.

Alexion Pharmaceuticals Inc.

In March 2017, we entered into a license agreement with Alexion Pharmaceuticals, Inc., ("Alexion") (Nasdaq:ALXN), that granted them exclusive use of our proprietary LNP technology in one of Alexion's rare disease programs. Under the terms of the license agreement, Alexion paid us $7.5 million upfront, and was set to pay $75 million for achievement of development, regulatory, and commercial milestones, as well as single-digit royalties. Arbutus conducted technology development and provided manufacturing and regulatory support. In July 2017, Alexion terminated its LNP licensing agreement with Arbutus driven by a strategic review of Alexion’s business and research and development portfolio, which included a decision to discontinue development of mRNA therapeutics. The pre-clinical work completed during this period enabled refinement of the LNP formulation process for mRNA development at a larger scale.

Monsanto Company

In January 2014, we signed an Option Agreement and a Service Agreement with Monsanto Company ("Monsanto"), and granted Monsanto an option to obtain a license to use our proprietary LNP delivery technology. Following the completion of the Phase A extension period in October 2015, no further research activities were conducted under the arrangement, as Monsanto did not elect to proceed to Phase B of the research plan. On March 4, 2016, Monsanto exercised its option to acquire 100% of the outstanding shares of Protiva Agricultural Development Company Inc. ("PADCo") and PADCo is no longer our indirect wholly-owned subsidiary. In connection with Monsanto’s exercise of its option, on March 4, 2016, we entered into an amended Option Agreement. We also entered into an amended Service Agreement on March 4, 2016 to give effect to the grant back to Arbutus of new intellectual property created by Monsanto in connection with the exercise of its option. In addition, we entered into an amended License and Services Agreement to recognize Monsanto’s early exercise of option before Arbutus' completion of Phases B and C, and to introduce a new technology transfer completion criteria.

Marina Biotech, Inc. /Arcturus Therapeutics, Inc.

In November 2012, we disclosed that we had obtained a worldwide, non-exclusive license to a novel RNAi trigger technology called Unlocked Nucleobase Analog (UNA) from Marina Biotech Inc., or Marina, for the development of RNAi therapeutics. UNAs can be incorporated into RNAi drugs and have the potential to improve them by increasing their stability and reducing off-target effects. In August 2013, Marina assigned its UNA technology to Arcturus Therapeutics, Inc., or Arcturus, and the UNA license agreement between us and Marina was assigned to Arcturus. The terms of the license are otherwise unchanged.

University of British Columbia

Certain early work on LNP delivery systems and related inventions was undertaken at the University of British Columbia ("UBC"). These inventions are licensed to us by UBC under a license agreement, initially entered in 1998 as amended in 2001, 2006 and 2007. We have granted sublicenses under the UBC license to Alnylam as well as to Spectrum. Alnylam has in turn sublicensed back to us certain of the licensed UBC patents. In mid-2009, we, along with our subsidiary Protiva, entered into a supplemental agreement with UBC, Alnylam and Acuitas regarding a separate research collaboration to be conducted among UBC, Alnylam and Acuitas to which we have license rights. The settlement agreement provided for the effective termination of all obligations under such supplemental agreement as between all of the parties. UBC subsequently filed a demand for arbitration against us for allegedly unpaid royalties based on publicly available information, and an unspecified amount based on non-public information. Please refer to "Item 3. Legal Proceedings" for additional information.

Patents and Proprietary Rights

Our commercial success depends in part on our ability to obtain and maintain proprietary protection for our drug candidates, novel discoveries, product development technologies and other know-how, to operate without infringing on the proprietary rights of others and to prevent others from infringing our proprietary rights. Our policy is to seek to protect our proprietary position by, among other methods, filing or in licensing 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, know how, continuing technological innovation and potential in licensing opportunities to develop and maintain our proprietary position.

In addition to our proprietary expertise, we own a portfolio of patents and patent applications directed to HBV cccDNA formation inhibitors, HBV core/capsid protein assembly inhibitors, HBV surface antigens secretion inhibitors, HBV cccDNA epigenetic modifiers, STING agonists, LNP inventions, LNP compositions for delivering nucleic acids such as mRNA and siRNA, the formulation and manufacture of LNP-based pharmaceuticals, chemical modification of RNAi molecules, and RNAi drugs and processes directed at particular disease indications. A large number of patent applications filed with the US and European Patent Offices have been granted. In the U.S. our patents might be challenged by interference or opposition proceedings. In Europe, upon grant, a period of nine months is allowed for notification of opposition to such granted patents. If our patents are subjected to interference or opposition proceedings, we would incur significant costs to defend them. Further, our failure to prevail in any such proceedings could limit the patent protection available to our therapeutic HBV programs or RNAi platform, including our product candidates.

We have a portfolio of approximately 125 patent families, in the U.S. and abroad, that are directed to our therapeutic HBV product candidates and various aspects of LNPs and LNP formulations. The portfolio includes over 100 issued patents throughout the world, and an extensive portfolio of pending patent applications, including the following patents and applications in the United States and Europe (1):

Subject Matter	Status	Expiration Date*
siRNA and LNP Compositions (HBV)	Patent applications pending in U.S. and other jurisdictions	2035
HBV Capsid Assembly Inhibitor Compositions and Methods of Treatment	Patent applications pending in U.S. and other jurisdictions	2032
Non-Liposomal Systems For Nucleic Acid Delivery	U.S. Pat. No. 9,518,272	2031

(1) Patent information current as of March 5, 2019.

* Once issued, the term of a US patent first filed after mid-1995 generally extends until the 20th anniversary of the filing date of the first non-provisional application to which such patent claims priority. It is important to note, however, that the United States Patent & Trademark Office ("USPTO"), sometimes requires the filing of a Terminal Disclaimer during prosecution, which may shorten the term of the patent. On the other hand, certain patent term adjustments may be available based on USPTO delays during prosecution. Similarly, in the pharmaceutical area, certain patent term extensions may be available based on the history of the drug in clinical trials. We cannot predict whether or not any such adjustments or extensions will be available or the length of any such adjustments or extensions.

Scientific Advisers

We seek advice from our scientific advisory board, which consists of a number of leading scientists and physicians, on scientific and medical matters.

Site Consolidation

In 2018, we substantially completed a site consolidation and organizational restructuring to align our HBV business in Warminster, PA, by reducing our global workforce by approximately 35% and by closing our facility in Burnaby, Canada. For further detail, refer to note 8 "Site Consolidation" in the consolidated financial statements in Part II - Item 8.

Employees

At December 31, 2018, Arbutus had 80 employees (79 full-time and 1 part-time), 60 of whom were engaged in research and development. None of our employees are represented by a labor union or covered by a collective bargaining agreement, nor have we experienced any work stoppages. We believe that relations with our employees are good.

Competition

We face a broad range of current and potential competitors, from established global pharmaceutical companies with significant resources, to development-stage companies. In addition, we face competition from academic and research institutions and government agencies for the discovery, development and commercialization of novel therapeutics to treat HBV. Many of our competitors, either alone or with their collaborative partners, have significantly greater financial, product development, technical, manufacturing, sales, and marketing resources than we do. In addition, many of our direct competitors are large pharmaceutical companies with internal research and development departments that have significantly greater experience in testing pharmaceutical products, obtaining FDA and other regulatory approvals of products, and achieving widespread market acceptance for those products.

As a significant unmet medical need exists for HBV, there are several large and small pharmaceutical companies focused on delivering therapeutics for treatment of HBV. These companies include, but are not limited to, Gilead Sciences, Johnson and Johnson, Assembly Biosciences, Roche, Replicor, Spring Bank, Alnylam, Arrowhead, ContraVir, Dicerna, Intellia, and Enanta. Further, it is likely that additional drugs will become available in the future for the treatment of HBV. These companies are developing products such as capsid inhibitors, RNAi agents, immune modulators, NAs, surface antigen inhibitors, entry inhibitors and gene editing agents. These products are in various stages of pre-clinical and clinical development.

We anticipate that we will face competition as new products enter the marketplace and advanced technologies become available. Our competitors' products may be safer, more effective, or more effectively marketed and sold than any product we may commercialize. Competitive products may render one or more of our product candidates obsolete or non-competitive before we can recover the expenses of developing and commercializing any of our product candidates. It is also possible that the development of a cure or new treatment methods for HBV could render one or more of our product candidates non-competitive, obsolete, or reduce the demand for our product candidates.

We believe that our ability to compete depends, in part, upon our ability to develop products, complete the clinical trials and regulatory approval processes, and effectively market any products we develop. Further, we need to attract and retain qualified personnel, obtain patent protection or otherwise develop proprietary product candidates or processes, and secure sufficient capital resources for the substantial time period between the discovery of lead compounds and their commercial sales, if any.

Government Regulation

Regulation by governmental authorities in the United States and in other countries is a significant consideration in our product development, manufacturing and, upon approval of our product candidates, marketing strategies. We expect that all our product candidates will require regulatory approval by the FDA and by similar regulatory authorities in foreign countries prior to commercialization and will be subjected to rigorous pre-clinical, clinical, and post-approval testing to demonstrate safety and effectiveness, as well as other significant regulatory requirements and restrictions in each jurisdiction in which we would seek to market our products. U.S. federal laws and regulations govern the testing, development, manufacture, quality control, safety, effectiveness, approval, storage, labeling, record keeping, reporting, distribution, import, export and marketing of all

biopharmaceutical products intended for therapeutic purposes. We believe that we and the third parties that work with us are in compliance in all material respects with currently applicable rules and regulations; however, any failure to comply could have a material negative impact on our ability to successfully develop and commercialize our products, and therefore on our financial performance. In addition, the rules and regulations that apply to our business are subject to change and it is difficult to foresee whether, how, or when such changes may affect our business.

Obtaining governmental approvals to market our product candidates and maintaining ongoing compliance with applicable regulations following any such approvals will require the expenditure of significant financial and human resources not currently at our disposal.

Development and Approval

The process to develop and obtain approval for biopharmaceutical compounds for commercialization in the United States and many other countries is lengthy, complex and expensive, and the outcome is far from certain. Although foreign requirements for conducting clinical trials and obtaining approval may differ in certain respects from those in the United States, there are many similarities and they often are equally rigorous and the outcome cannot be predicted with confidence. A key component of any submission for approval in any jurisdiction is pre-clinical and clinical data demonstrating the product candidate's safety and effectiveness.

Pre-clinical Testing. Before testing any compound in humans in the United States, a company must develop pre-clinical data, generally including laboratory evaluation of the product candidate's chemistry and formulation, as well as toxicological and pharmacological studies in animal species to assess safety and quality. Certain types of animal studies must be conducted in compliance with the FDA's Good Laboratory Practice regulations and the Animal Welfare Act, which is enforced by the Department of Agriculture.

IND Application. A person or entity sponsoring clinical trials in the United States to evaluate a product candidate's safety and effectiveness must submit to the FDA, prior to commencing such studies, an investigational new drug ("IND") application, which contains pre-clinical testing results and provides a basis for the FDA to conclude that there is an adequate basis for testing the drug in humans. If the FDA does not object to the IND application within 30 days of submission, the clinical testing proposed in the IND may begin. Even after the IND has gone into effect and clinical testing has begun, the FDA may put the clinical trials on "clinical hold," suspending (or in some cases, ending) them because of safety concerns or for other reasons.

Clinical Trials. Clinical trials involve administering a drug to human volunteers or patients under the supervision of a qualified clinical investigator. Clinical trials are subject to extensive regulation. In the United States, this includes compliance with the FDA's bioresearch monitoring regulations and current good clinical practices ("cGCP") requirements, which establish standards for conducting, recording data from, and reporting the results of clinical trials, with the goal of assuring that the data and results are credible and accurate and that study participants' rights, safety and well-being are protected. Each clinical trial must be conducted under a protocol that details, among other things, the study objectives and parameters for monitoring safety and the efficacy criteria, if any, to be evaluated. The protocol is submitted to the FDA as part of the IND and reviewed by the agency before the study begins. Additionally, each clinical trial must be reviewed, approved and conducted under the auspices of an Institutional Review Board ("IRB"). The sponsor of a clinical trial, the investigators and IRBs each must comply with requirements and restrictions that govern, among other things, obtaining informed consent from each study subject, complying with the protocol and investigational plan, adequately monitoring the clinical trial, and timely reporting adverse events. Foreign studies conducted under an IND must meet the same requirements applicable to studies conducted in the United States. However, if a foreign study is not conducted under an IND, the data may still be submitted to the FDA in support of a product application, if the study was conducted in accordance with cGCP and the FDA is able to validate the data.

The sponsor of a clinical trial or the sponsor's designated responsible party may be required to register certain information about the trial and disclose certain results on government or independent registry websites, such as http://clinicaltrials.gov.

Clinical testing is typically performed in three phases, which may overlap or be subdivided in some cases.

In Phase 1, the drug is administered to a small number of human subjects to assess its safety and to develop detailed profiles of its pharmacological and pharmacokinetic actions (*i.e.*, absorption, distribution, metabolism and excretion). Although Phase 1 trials typically are conducted in healthy human subjects, in some instances (including, for example, with some cancer therapies) the study subjects are patients with the targeted disease or condition.

In Phase 2, the drug is administered to a relatively small sample of the intended patient population to develop initial data regarding efficacy in the targeted disease, determine the optimal dose range, and generate additional information regarding the drug's safety. Additional animal toxicology studies may precede this phase.

In Phase 3, the drug is administered to a larger group of patients, which may include patients with concomitant diseases and medications. Typically, Phase 3 trials are conducted at multiple study sites and may be conducted concurrently for the sake of time and efficiency. The purpose of Phase 3 clinical trials is to obtain additional information about safety and effectiveness necessary to evaluate the drug's overall risk-benefit profile and to provide a basis for product labeling. Phase 3 data often form the core basis on which the FDA evaluates a product candidate's safety and effectiveness when considering the product application.

The study sponsor, the FDA or an IRB may suspend or terminate a clinical trial at any time on various grounds, including a determination that study subjects are being exposed to an unacceptable health risk. Success in early-stage clinical trials does not assure success in later-stage clinical trials, and data from clinical trials are not always conclusive and may be subject to alternative interpretations that could delay, limit or prevent approval.

NDA Submission and Review. After completing the clinical studies, a sponsor seeking approval to market a drug in the United States submits to the FDA a New Drug Application ("NDA"). The NDA is a comprehensive, multi-volume application intended to demonstrate the product's safety and effectiveness and includes, among other things, pre-clinical and clinical data, information about the drug's composition, the sponsor's plans for manufacturing and packaging and proposed labeling. When an NDA is submitted, the FDA makes an initial determination as to whether the application is sufficiently complete to be accepted for review. If the application is not, the FDA may refuse to accept the NDA for filing and request additional information. A refusal to file, which requires resubmission of the NDA with the requested additional information, delays review of the application.

FDA performance goals generally provide for action on an NDA within 10 months of the 60-day filing date, or within 12 months of its submission. That deadline can be extended under certain circumstances, including by the FDA's requests for additional information. The targeted action date can also be shortened to 6 months of the 60-day filing date, or 8 months after submission for products that are granted priority review designation because they are intended to treat serious or life-threatening conditions and demonstrate the potential to address unmet medical needs. The FDA has other programs to expedite development and review of product candidates that address serious or life-threatening conditions. For example, the Fast Track program is intended to facilitate the development and review of new drugs that demonstrate the potential to address unmet medical needs involving serious or life-threatening diseases or conditions. If a drug receives Fast Track designation, the FDA may review sections of the NDA on a rolling basis, rather than requiring the entire application to be submitted to begin the review. Products with Fast Track designation also may be eligible for more frequent meetings and correspondence with the FDA about the product's development. Another FDA program intended to expedite development is Accelerated Approval, which allows approval on the basis of a surrogate endpoint that is reasonably likely to predict clinical benefit. Breakthrough Therapy designation, which is available for drugs under development for serious or life-threatening conditions and where preliminary clinical evidence shows that the drug may have substantial improvement on at least one clinically significant endpoint over available therapy, means that a drug will be eligible for all of the benefits of Fast Track designation, as well as more intensive guidance from the FDA on an efficient drug development program and a commitment from the agency to involve senior FDA managers in such guidance. Even if a product candidate qualifies for Fast Track designation or Breakthrough Therapy designation, the FDA may later decide that the product no longer meets the conditions for designation, and/or may determine that the product does not meet the standards for approval. As applicable, we anticipate seeking to utilize these programs to expedite the development and review of our product candidates, but we cannot ensure that our product candidates will qualify for such programs.

If the FDA concludes that an NDA does not meet the regulatory standards for approval, it typically issues a Complete Response letter, which communicates the reasons for the agency's decision not to approve the application and may request additional information, including additional clinical data. An NDA may be resubmitted with the deficiencies addressed, but resubmission does not guarantee approval. Data from clinical trials are not always conclusive, and the FDA's interpretation of data may differ from the sponsor's. Obtaining approval can take years, requires substantial resources and depends on a number of factors, including the severity of the targeted disease or condition, the availability of alternative treatments, and the risks and benefits demonstrated in clinical trials. Additionally, as a condition of approval, the FDA may impose restrictions that could affect the commercial prospects of a product and increase our costs, such as a Risk Evaluation and Mitigation Strategy ("REMS"), and/or post-approval commitments to conduct additional clinical or non-clinical studies or to conduct surveillance programs to monitor the drug's effects.

Moreover, once a product is approved, information about its safety or effectiveness from broader clinical use may limit or prevent successful commercialization because of regulatory action or market forces or for other reasons. Post-approval modifications to a drug product, such as changes in indications, labeling or manufacturing processes or facilities, may require development and submission of additional information or data in a new or supplemental NDA, which would also require FDA approval.

Exclusivity and Patent Protection. In the United States and elsewhere, certain regulatory exclusivities and patent rights can provide an approved drug product with protection from certain competitors' products for a period of time and within

a certain scope. In the United States, those protections include regulatory exclusivity under the under the Drug Price Competition and Patent Term Restoration Act of 1984 (the "Hatch-Waxman Act"). The Hatch-Waxman Act provides periods of exclusivity for a branded drug product that would serve as a reference listed drug ("RLD") for a generic drug applicant filing an abbreviated new drug application ("ANDA") or for an applicant filing a 505(b)(2) NDA application. If such a product is a "new chemical entity" ("NCE") generally meaning that the active moiety has never before been approved in any drug, there is a period of five years from the product's approval during which the FDA may not accept for filing any ANDA or 505(b)(2) application for a drug with the same active moiety. An ANDA or 505(b)(2) application may be submitted after four years, however, if the sponsor of the application makes a Paragraph IV certification (as described below). Such a product that is not an NCE may qualify for a three-year period of exclusivity if its NDA contains new clinical data, derived from studies conducted by or for the sponsor, that were necessary for approval. In this instance, the three-year exclusivity period does not preclude filing or review of an ANDA or 505(b)(2) application; rather, the FDA is precluded from granting final approval to the ANDA or 505(b)(2) application until three years after approval of the RLD. This 3-year exclusivity applies only to the conditions of approval that required submission of the clinical data.

The Hatch-Waxman Act also provides for the restoration of a portion of the patent term lost during product development and FDA review of an NDA if approval of the application is the first permitted commercial marketing of a drug containing the active ingredient. The patent term restoration period is generally one-half the time between the effective date of the IND or the date of patent grant (whichever is later) and the date of submission of the NDA, plus the time between the date of submission of the NDA and the date of FDA approval of the product. The maximum period of restoration is five years, and the patent cannot be extended to more than 14 years from the date of FDA approval of the product. Only one patent claiming each approved product is eligible for restoration and the patent holder must apply for restoration within 60 days of approval.

Competition. The Hatch-Waxman Act establishes two abbreviated approval pathways for drug products that are in some way follow-on versions of already approved branded NDA products: (i) generic versions of the approved RLD, which may be approved under an ANDA by showing that the generic product is the "same as" the approved product in key respects; and (ii) a product that is similar but not identical to the RLD, which may be approved under a 505(b)(2) NDA, in which the sponsor relies to some degree on the FDA's finding that the RLD is safe and effective, but submits its own product-specific data to support the differences between the product and the RLD.

The sponsor of an ANDA or 505(b)(2) application seeking to rely on an approved product as the RLD must make one of several certifications regarding each patent for the RLD that is listed in the FDA publication, *Approved Drug Products with Therapeutic Equivalence Evaluations*, which is referred to as the *Orange Book*. A "Paragraph III" certification is the sponsor's statement that it will wait for the patent to expire before obtaining approval for its product. A "Paragraph IV" certification is an assertion that the patent does not block approval of the later product, either because the patent is invalid or unenforceable or because the patent, even if valid, is not infringed by the new product. Once the FDA accepts for filing an ANDA or 505(b)(2) application containing a Paragraph IV certification, the applicant must within 20 days provide notice to the RLD NDA holder and patent owner that the application has been submitted, and provide the factual and legal basis for the applicant's assertion that the patent is invalid or not infringed. If the NDA holder or patent owner files suit against the ANDA or 505(b)(2) applicant for patent infringement within 45 days of receiving the Paragraph IV notice, the FDA is prohibited from approving the ANDA or 505(b)(2) application for a period of 30 months or the resolution of the underlying suit, whichever is earlier.

Post-Approval Regulation

Once approved, drug products are subject to continuing extensive regulation by the FDA. If ongoing regulatory requirements are not met, or if safety problems occur after a product reaches market, the FDA may take actions to change the conditions under which the product is marketed, including limiting, suspending or even withdrawing approval. In addition to FDA regulation, our business is also subject to extensive federal, state, local and foreign regulation.

Good Manufacturing Practices. Companies engaged in manufacturing drug products or their components must comply with applicable current Good Manufacturing Practice ("cGMP") requirements, which include requirements regarding organization and training of personnel, building and facilities, equipment, control of components and drug product containers, closures, production and process controls, packaging and labeling controls, holding and distribution, laboratory controls and records and reports. The FDA inspects equipment, facilities and manufacturing processes before approval and conducts periodic re-inspections after approval. Failure to comply with applicable cGMP requirements or the conditions of the product's approval may lead the FDA to seek sanctions, including fines, civil penalties, injunctions, suspension of manufacturing operations, imposition of operating restrictions, withdrawal of FDA approval, seizure or recall of products, and criminal prosecution. Although we periodically monitor FDA compliance of the third parties on which we rely for manufacturing our drug products, we cannot be certain that our present or future third-party manufacturers will consistently comply with cGMP or other applicable FDA regulatory requirements.

Sales and Marketing. Once a product is approved, its advertising, promotion and marketing will be subject to close regulation, including with regard to promotion to healthcare practitioners, direct-to-consumer advertising, communications regarding unapproved uses, industry-sponsored scientific and educational activities and promotional activities involving the internet. In addition to FDA restrictions on marketing of pharmaceutical products, state and federal fraud and abuse laws have been applied to restrict certain marketing practices in the pharmaceutical industry. Failure to comply with applicable requirements in this area may subject a company to adverse publicity, investigations and enforcement action by the FDA, the Department of Justice, the Office of the Inspector General of the Department of Health and Human Services, and/or state authorities. This could subject a company to a range of penalties that could have a significant commercial impact, including civil and criminal fines and agreements that materially restrict the manner in which a company promotes or distributes drug products.

Other Requirements. Companies that manufacture or distribute drug products pursuant to approved NDAs must meet numerous other regulatory requirements, including adverse event reporting, submission of periodic reports, and record-keeping obligations.

Fraud and Abuse Laws. At such time as we market, sell and distribute any products for which we obtain marketing approval, it is possible that our business activities could be subject to scrutiny and enforcement under one or more federal or state health care fraud and abuse laws and regulations, which could affect our ability to operate our business. These restrictions under applicable federal and state health care fraud and abuse laws and regulations that may affect our ability to operate include:

- The federal Anti-Kickback Law, which prohibits, among other things, knowingly or willingly offering, paying, soliciting or receiving remuneration, directly or indirectly, in cash or in kind, to induce or reward the purchasing, leasing, ordering or arranging for or recommending the purchase, lease or order of any health care items or service for which payment may be made, in whole or in part, by federal healthcare programs such as Medicare and Medicaid. This statute has been interpreted to apply to arrangements between pharmaceutical companies on one hand and prescribers, purchasers and formulary managers on the other. Liability may be established under the federal Anti-Kickback Law without proving actual knowledge of the statute or specific intent to violate it. In addition, the government may assert that a claim including items or services resulting from a violation of the federal Anti-Kickback Law constitutes a false or fraudulent claim for purposes of the federal civil False Claims Act. Although there are a number of statutory exemptions and regulatory safe harbors to the federal Anti-Kickback Law protecting certain common business arrangements and activities from prosecution or regulatory sanctions, the exemptions and safe harbors are drawn narrowly, and practices that do not fit squarely within an exemption or safe harbor, or for which no exception or safe harbor is available, may be subject to scrutiny.
- The federal civil False Claims Act, which prohibits, among other things, individuals or entities from knowingly presenting, or causing to be presented, a false or fraudulent claim for payment of government funds or knowingly making, using or causing to be made or used, a false record or statement material to an obligation to pay money to the government or knowingly concealing or knowingly and improperly avoiding, decreasing or concealing an obligation to pay money to the federal government. Many pharmaceutical and other healthcare companies have been investigated and have reached substantial financial settlements with the federal government under the civil False Claims Act for a variety of alleged improper marketing activities, including: providing free product to customers with the expectation that the customers would bill federal programs for the product; providing sham

consulting fees, grants, free travel and other benefits to physicians to induce them to prescribe the company's products; and inflating prices reported to private price publication services, which are used to set drug payment rates under government healthcare programs. In addition, in recent years the government has pursued civil False Claims Act cases against a number of pharmaceutical companies for causing false claims to be submitted as a result of the marketing of their products for unapproved, and thus non-reimbursable, uses. Pharmaceutical and other healthcare companies also are subject to other federal false claim laws, including, among others, federal criminal healthcare fraud and false statement statutes that extend to non-government health benefit programs.

- Analogous state and local laws and regulations, such as state anti-kickback and false claims laws, which may apply to sales or marketing arrangements and claims involving healthcare items or services reimbursed by non-governmental third-party payors, including private insurers; state and foreign 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 or otherwise restrict payments that may be made to healthcare providers; state laws that restrict the ability of manufacturers to offer co-pay support to patients for certain prescription drugs; and state and foreign laws that require drug manufacturers to report information related to clinical trials, or information related to payments and other transfers of value to physicians and other healthcare providers or marketing expenditures; state laws and local ordinances that require identification or licensing of sales representatives.
- The federal Physician Payment Sunshine Act, being implemented as the Open Payments Program, which requires 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 CMS information related to direct or indirect payments and other transfers of value to physicians and teaching hospitals, as well as ownership and investment interests held in the company by physicians and their immediate family members. Beginning in 2022, applicable manufacturers also will be required to report information regarding payments and transfers of value provided to physician assistants, nurse practitioners, clinical nurse specialists, certified nurse anesthetists, and certified nurse-midwives.
- The federal Foreign Corrupt Practices Act of 1997 and other similar anti-bribery laws in other jurisdictions generally prohibit companies and their intermediaries from providing money or anything of value to officials of foreign governments, foreign political parties or international organizations with the intent to obtain or retain business or seek a business advantage. 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 proceedings by both the Department of Justice and the U.S. Securities and Exchange Commission (the "SEC"). Violations of United States or foreign laws or regulations could result in the imposition of substantial fines, interruptions of business, loss of supplier, vendor or other third-party relationships, termination of necessary licenses and permits and other legal or equitable sanctions. Other internal or government investigations or legal or regulatory proceedings, including lawsuits brought by private litigants, may also follow as a consequence.

Violations of any of the laws described above or any other governmental regulations are punishable by significant civil, criminal and administrative penalties, damages, fines and exclusion from government-funded healthcare programs, such as Medicare and Medicaid. Although compliance programs can mitigate the risk of investigation and prosecution for violations of these laws, the risks cannot be entirely eliminated. Moreover, achieving and sustaining compliance with applicable federal and state privacy, security and fraud laws may prove costly.

Privacy Laws. We are also subject to laws and regulations covering data privacy and the protection of health-related and other personal information. The legislative and regulatory landscape for privacy and data protection continues to evolve, and there has been an increasing focus on privacy and data protection issues that may affect our business, including recently enacted laws in all jurisdictions where we operate. Numerous federal and state laws, including state security breach notification laws, state health information privacy laws and federal and state consumer protection laws, govern the collection, use and disclosure of personal information. Failure to comply with such laws and regulations could result in government enforcement actions and create liability for us (including the imposition of significant penalties), private litigation and/or adverse publicity that could negatively affect our business. In addition, if we successfully commercialize our product candidates, we may obtain patient health information from healthcare providers who prescribe our products and research institutions we collaborate with, and they are subject to privacy and security requirements under the Health Insurance Portability and Accountability Act of 1996, as amended by the Health Information Technology for Economic and Clinical Health Act of 2009 (collectively, "HIPAA"). Although we are not directly subject to HIPAA other than with respect to providing certain employee benefits, we could potentially be subject to criminal penalties if we knowingly obtain or disclose individually identifiable health information maintained by a HIPAA-covered entity in a manner that is not authorized or permitted by HIPAA.

Coverage and Reimbursement

Significant uncertainty exists as to the coverage and reimbursement status of any product candidates for which we may obtain regulatory approval. The regulations that govern marketing approvals, pricing and reimbursement for new drug products vary widely from country to country. Current and future legislation may significantly change the approval requirements in ways that could involve additional costs and cause delays in obtaining approvals. Some countries require approval of the sale price of a drug before it can be marketed. In many countries, the pricing review period begins after marketing or product licensing approval is granted. In some foreign markets, prescription pharmaceutical pricing remains subject to continuing governmental control even after initial approval is granted. As a result, we might obtain marketing approval for a product in a particular country, but then be subject to price regulations that delay our commercial launch of the product, possibly for lengthy time periods, which could negatively impact the revenues we are able to generate from the sale of the product in that particular country. Adverse pricing limitations may hinder our ability to recoup our investment in one or more product candidates even if our product candidates obtain marketing approval.

Our ability to commercialize any products successfully also will depend in part on the extent to which coverage and adequate reimbursement for these products and related treatments will be available in a timely manner from government third-party payors, including government healthcare programs such as Medicare and Medicaid, commercial health insurers and managed care organizations. Government authorities and other third-party payors, such as private health insurers and health maintenance organizations, determine which medications they will cover and establish reimbursement levels. Third-party payors may limit coverage to specific products on an approved list, or formulary, which may not include all of the FDA-approved products for a particular indication. The process for determining whether a payor will provide coverage for a product may be separate from the process for setting the price or reimbursement rate that the payor will pay for the product once coverage is approved.

A primary trend in the U.S. healthcare industry and elsewhere is cost containment. Government healthcare programs and other third-party payors are increasingly challenging the prices charged for medical products and services and examining the medical necessity and cost-effectiveness of medical products and services, in addition to their safety and efficacy, and have attempted to control costs by limiting coverage and the amount of reimbursement for particular medications. Increasingly, third-party payors are requiring that drug companies provide them with predetermined discounts from list prices and are challenging the prices charged for medical products. We cannot be sure that coverage and reimbursement will be available promptly or at all for any product that we commercialize and, if reimbursement is available, what the level of reimbursement will be. Moreover, eligibility for coverage and reimbursement does not imply that any drug will be paid for in all cases. Limited coverage may impact the demand for, or the price of, any product candidate for which we obtain marketing approval. If coverage and reimbursement are not available or reimbursement is available only to limited levels, we may not successfully commercialize any product candidate for which we obtain marketing approval.

Obtaining coverage and adequate reimbursement is a time-consuming and costly process. There may be significant delays in obtaining coverage and reimbursement for newly approved drugs, and coverage may be more limited than the purposes for which the drug is approved by the FDA or comparable foreign regulatory authorities. Moreover, eligibility for coverage and reimbursement does not imply that a drug will be paid for in all cases or at a rate that covers our costs, including research, development, manufacture, sale and distribution. Interim reimbursement levels for new drugs, if applicable, may also not be sufficient to cover our costs and may only be temporary. Reimbursement rates may vary according to the use of the drug and the clinical setting in which it is used, may be based on reimbursement levels already set for lower cost drugs and may be incorporated into existing payments for other services. Net prices for drugs may be reduced by mandatory discounts or rebates required by government healthcare programs or private payors and by any future relaxation of laws that presently restrict imports of drugs from countries where they may be sold at lower prices than in the United States. Limited coverage may impact the demand for, or the price of, any product candidate for which we obtain marketing approval. Third-party payors also may seek additional clinical evidence, including expensive pharmacoeconomic studies, beyond the data required to obtain marketing approval, demonstrating clinical benefits and value in specific patient populations, before covering our products for those patients. If reimbursement is available only for limited indications, we may not be able to successfully commercialize any product candidate for which we obtain marketing approval. Our inability to promptly obtain coverage and profitable reimbursement rates from both government-funded and private payors for any approved products that we develop could have a material adverse effect on our operating results, our ability to raise capital needed to commercialize products and our overall financial condition.

If we successfully commercialize any of our products, we may participate in the Medicaid Drug Rebate Program. Participation is required for federal funds to be available for our products under Medicaid and Medicare Part B. Under the Medicaid Drug Rebate Program, we would be required to pay a rebate to each state Medicaid program for our covered outpatient drugs that are dispensed to Medicaid beneficiaries and paid for by a state Medicaid program as a condition of having federal funds being made available to the states for our drugs under Medicaid and Part B of the Medicare program.

Federal law requires that any company that participates in the Medicaid Drug Rebate Program also participate in the Public Health Service’s 340B drug pricing program in order for federal funds to be available for the manufacturer’s drugs under

Medicaid and Medicare Part B. The 340B program requires participating manufacturers to agree to charge statutorily-defined covered entities no more than the 340B "ceiling price" for the manufacturer's covered outpatient drugs. These 340B covered entities include a variety of community health clinics and other entities that receive health services grants from the Public Health Service, as well as hospitals that serve a disproportionate share of low-income patients.

In addition, in order to be eligible to have its products paid for with federal funds under the Medicaid and Medicare Part B programs and purchased by the Department of Veterans Affairs (the "VA"), Department of Defense ("DoD"), Public Health Service, and Coast Guard (the "Big Four agencies") and certain federal grantees, a manufacturer also must participate in the VA Federal Supply Schedule ("FSS") pricing program, established by Section 603 of the Veterans Health Care Act of 1992 (the "VHCA"). Under this program, the manufacturer is obligated to make its covered drugs (innovator multiple source drugs, single source drugs, and biologics) available for procurement on an FSS contract and charge a price to the Big Four agencies that is no higher than the Federal Ceiling Price ("FCP"), which is a price calculated pursuant to a statutory formula. The FCP is derived from a calculated price point called the "non-federal average manufacturer price" ("Non-FAMP"), which we will be required to calculate and report to the VA on a quarterly and annual basis. Moreover, pursuant to Defense Health Agency ("DHA") regulations, manufacturers must provide rebates on utilization of their innovator and single source products that are dispensed to TRICARE beneficiaries by TRICARE network retail pharmacies. The formula for determining the rebate is established in the regulations and is based on the difference between the annual non-federal average manufacturer price and the Federal Ceiling Price, each required to be calculated by us under the VHCA. The requirements under the Medicaid Drug Rebate Program, 340B program, FSS, and TRICARE programs could reduce the revenue we may generate from any products that are commercialized in the future and could adversely affect our business and operating results.

United States Healthcare Reform

The United States and many foreign jurisdictions have enacted or proposed legislative and regulatory changes affecting the healthcare system that could prevent or delay marketing approval of our product candidates, restrict or regulate post-approval activities and affect our ability to profitably sell any product candidate for which we obtain marketing approval. The United States government, state legislatures and foreign governments also have shown significant interest in implementing cost-containment programs to limit the growth of government-paid healthcare costs, including price controls, restrictions on reimbursement and requirements for substitution of generic products for branded prescription drugs.

In recent years, Congress has considered reductions in Medicare reimbursement levels for drugs administered by physicians. CMS, the agency that administers the Medicare and Medicaid programs, also has authority to revise reimbursement rates and to implement coverage restrictions for some drugs. Cost reduction initiatives and changes in coverage implemented through legislation or regulation could decrease utilization of and reimbursement for any approved products, which in turn would affect the price we can receive for those products. While Medicare regulations apply only to drug benefits for Medicare beneficiaries, private payors often follow Medicare coverage policy and payment limitations in setting their own reimbursement rates. Therefore, any reduction in reimbursement that results from federal legislation or regulation may result in a similar reduction in payments from private payors.

The Affordable Care Act, as amended by the Health Care and Education Reconciliation Act (collectively, the "Affordable Care Act"), has substantially changed the way healthcare is financed by both governmental and private insurers, and significantly impacts the pharmaceutical industry. The Affordable Care Act is intended to broaden access to health insurance, reduce or constrain the growth of healthcare spending, enhance remedies against healthcare fraud and abuse, add new transparency requirements for healthcare and health insurance industries, impose new taxes and fees on pharmaceutical and medical device manufacturers, and impose additional health policy reforms.

Some of the provisions of the Affordable Care Act have yet to be fully implemented, and certain provisions have been subject to judicial and Congressional challenges. In addition, there have been efforts by the Trump Administration to repeal or replace certain aspects of the Affordable Care Act and to alter the implementation of the Affordable Care Act and related laws. For example, the Tax Cuts and Jobs Act, enacted on December 22, 2017, eliminated the tax-based shared responsibility payment for individuals who fail to maintain minimum essential coverage under section 5000A of the Internal Revenue Code of 1986, commonly referred to as the individual mandate, effective January 1, 2019. Additional legislative changes, regulatory changes, and judicial challenges related to the Affordable Care Act remain possible. Any such changes could decrease the number of individuals with health coverage. It is possible that the Affordable Care Act, as currently enacted or as it may be amended in the future, and other healthcare reform measures that may be adopted in the future could have a material adverse effect on our industry generally and on our ability to successfully commercialize our product candidates, if approved. In December 2018, a United States District Court Judge for the Northern District of Texas ruled that the entire Affordable Care Act is unconstitutional because the tax penalty associated with the individual mandate was repealed by Congress as part of the Tax Cuts and Jobs Act. This ruling is under appeal and stayed pending appeal. It is unclear how this decision, subsequent appeals and other efforts to repeal or replace, or invalidate, the Affordable Care Act, regulations promulgated under the Affordable Care Act, or portions thereof, will impact the Affordable Care Act and its implementation, and our business.

In addition, other legislative changes have been proposed and adopted since the Affordable Care Act was enacted. For example, recent legislative enactments have resulted in Medicare payments being subject to a two percent reduction, referred to as sequestration, until 2027. Continuation of sequestration or enactment of other reductions in Medicare reimbursement for drugs could affect our ability to achieve a profit on any candidate products that are approved for marketing.

We expect that the Affordable Care Act, as well as other healthcare reform measures that have been adopted and may be adopted in the future, may result in more rigorous coverage criteria and new payment methodologies, and in additional downward pressure on coverage and payment and the price that we receive for any approved product, and could seriously harm our future revenues. Any reduction in reimbursement from Medicare, Medicaid or other government programs may result in a similar reduction in payments from private payors. The implementation of cost containment measures or other healthcare reforms may prevent us from being able to generate revenue, attain profitability or commercialize our products.

Foreign Regulation

In addition to regulations in the United States, we will be subject to a number of significant regulations in other jurisdictions regarding clinical trials, approval, manufacturing, marketing and promotion and safety reporting. These requirements and restrictions vary from country to country, but in many instances are similar to the United States requirements, and failure to comply with them could have the same negative effects as noncompliance in the United States.

Corporate Information

Arbutus Biopharma Corporation is a publicly traded industry-leading therapeutic solutions company focused on discovering, developing and commercializing a cure for patients suffering from chronic HBV infection.

Tekmira Pharmaceuticals Corporation ("Tekmira") was incorporated pursuant to the British Columbia Business Corporations Act ("BCBCA") on October 6, 2005, and commenced active business on April 30, 2007, when Tekmira and its parent company, Inex Pharmaceuticals Corporation, or Inex ("Inex"), were reorganized under a statutory plan of arrangement (the "Plan of Arrangement") completed under the provisions of the BCBCA. Pursuant to the Plan of Arrangement, all of Inex's business was transferred to Tekmira.

On March 4, 2015, we completed a business combination pursuant to which OnCore Biopharma, Inc. ("OnCore"), became our wholly-owned subsidiary of Tekmira.

On July 31, 2015, we changed our corporate name from Tekmira Pharmaceuticals Corporation to Arbutus Biopharma Corporation and OnCore changed its corporate name to Arbutus Biopharma, Inc.

We have two wholly-owned subsidiaries as of December 31, 2018: Arbutus Biopharma, Inc. and Arbutus Biopharma US Holdings, Inc., which was formed in 2018.

Protiva was acquired on May 30, 2008. On January 1, 2018, Protiva was amalgamated with Arbutus Biopharma Corporation.

Unless stated otherwise or the context otherwise requires, references herein to "Arbutus", "we", "us" and "our" refer to Arbutus Biopharma Corporation, and, unless the context requires otherwise, the subsidiaries through which we conduct business.

Our head office is located at 100-8900 Glenlyon Parkway, Burnaby, British Columbia, Canada, V5J 5J8 (telephone: (604) 419-3200) and our registered and records office is located at 700 West Georgia St, 25th Floor, Vancouver, British Columbia, Canada, V7Y 1B3. Our US operations are located at 701 Veterans Circle, Warminster, Pennsylvania, USA, 18974.

Investor Information

We are a reporting issuer in Canada under the securities laws of each of the Provinces of Canada. Our common shares trade on the Nasdaq Global Select Market under the symbol “ABUS”. We maintain a website at http://www.arbutusbio.com. The information on our website is not incorporated by reference into this annual report on Form 10-K and should not be considered to be a part of this annual report on Form 10-K. Our website address is included in this annual report on Form 10-K as an inactive technical reference only. Our reports filed or furnished pursuant to Section 13(a) or 15(d) of the Securities Exchange Act of 1934, as amended, including our annual reports on Form 10-K (and our annual reports on Form 20-F up to the year ended December 31, 2012), our quarterly reports on Form 10-Q (and our quarterly reports on Form 6-K up to the quarter-ended September 30, 2013) and our current reports on Form 8-K, and amendments to those reports, are accessible through our website, free of charge, as soon as reasonably practicable after these reports are filed electronically with, or otherwise furnished to, the United States Securities and Exchange Commission ("SEC"). We also make available on our website the charters of our audit committee, executive compensation and human resources committee and corporate governance and nominating committee, whistleblower policy, insider trading policy, corporate disclosure policy, related persons transactions policy and majority voting policy, as well as our code of business conduct and ethics for directors, officers and employees. In addition, we intend to disclose on our web site any amendments to, or waivers from, our code of business conduct and ethics that are required to be disclosed pursuant to the SEC rules.

The SEC also maintains a website that contains reports, proxy and information statements, and other information regarding Arbutus and other issuers that file electronically with the SEC. The SEC’s website address is http://www.sec.gov.

Item 1A. Risk Factors

Our business is subject to substantial risks and uncertainties. The occurrence of any of the following risks and uncertainties, either alone or taken together, could materially and adversely affect our business, financial condition, results of operations or prospects. In these circumstances, the market price of our common shares could decline and you may lose all or part of your investment. The risks and uncertainties described below are not the only ones we face. Risks and uncertainties of general applicability and additional risks and uncertainties not currently known to us or that we currently deem to be immaterial may also materially and adversely affect our business, financial condition, results of operations or prospects.

Risks Related to Our Business, our Financial Results and Need for Additional Capital

We are in the early stages of our development, and there is a limited amount of information about us upon which you can evaluate our product candidates.

We have not begun to market or generate revenues from the commercialization of any of our product candidates. We have only a limited history upon which one can evaluate our business and prospects as our product candidates are still at an early stage of development and thus we have limited experience and have not yet demonstrated an ability to successfully overcome many of the risks and uncertainties frequently encountered by companies in new and rapidly evolving fields, particularly in the biopharmaceutical area. For example, to execute our business plan, we will need to successfully:

- execute research and development activities using technologies involved in the development of our product candidates;
- build, maintain and protect a strong intellectual property portfolio;
- gain approval and acceptance for the development and commercialization of any product candidates we develop;
- conduct sales and marketing activities;
- develop and maintain successful strategic relationships; and
- manage our spending and cash requirements as our expenses are expected to continue to increase due to research and pre-clinical work, clinical trials, regulatory approvals, commercialization and maintaining our intellectual property portfolio.

If we are unsuccessful in accomplishing these objectives, we may not be able to develop our product candidates, raise capital, expand our business or continue our operations. The approach we are taking to discover and develop novel product candidates is unproven and may never lead to marketable products.

We are concentrating and intend to continue to concentrate our internal research and development efforts primarily on the discovery and development of product candidates targeting chronic HBV in order to ultimately develop a cure for the

disease. Our future success depends in part on the successful development of these product candidates. Our approach to the treatment of HBV is unproven, and we do not know whether we will be able to develop any products of commercial value.

There is no known cure for HBV. Any compounds that we develop may not effectively address HBV persistence. Even if we are able to develop compounds that address one or more of the key factors in the HBV life cycle (e.g., HBV replication, HBsAg expression and immune reactivation), targeting these key factors has not been proven to cure HBV. If we cannot develop compounds to achieve our goal of curing HBV internally, we may be unable to acquire additional product candidates on terms acceptable to us, or at all. Even if we are able to acquire or develop product candidates that address one of these mechanisms of action in pre-clinical studies, we may not succeed in demonstrating safety and efficacy of the product candidate in clinical trials. If we are unable to identify suitable compounds for pre-clinical and clinical development, we will not succeed in realizing our goal of a cure for HBV.

We will require substantial additional capital to fund our operations. If additional capital is not available, we may need to delay, limit or eliminate our research, development and commercialization processes and modify our business strategy.

Our principal sources of liquidity are cash, cash equivalents and short-term investments of $124.6 million as of December 31, 2018. We believe that our existing cash and cash equivalents will be sufficient to fund our operations into 2020. However, changing circumstances may cause us to consume capital faster than we currently anticipate, and we may need to spend more money than currently expected because of such circumstances. Within the next several years, substantial additional funds will be required to continue with the active development of our pipeline product candidates and technologies. In particular, our funding needs may vary depending on a number of factors including:

- revenues earned from our licensing partners, including Alnylam, Gritstone and Spectrum;
- the extent to which we continue the development of our product candidates or form licensing arrangements to advance our product candidates;
- our decisions to in-license or acquire additional products, product candidates or technology for development;
- our ability to attract and retain corporate partners, and their effectiveness in carrying out the development and ultimate commercialization of our product candidates;
- whether batches of drugs that we manufacture fail to meet specifications resulting in delays and investigational and remanufacturing costs;
- the decisions, and the timing of decisions, made by health regulatory agencies regarding our technology and product candidates;
- competing technological and market developments; and
- prosecuting and enforcing our patent claims and other intellectual property rights.

We will seek to obtain funding to maintain and advance our business from a variety of sources including equity financings, debt financings, licensing agreements, partnerships, government grants and contracts and other strategic transactions and funding opportunities. There can be no assurance that we will be able to complete any such transaction on acceptable terms or otherwise.

If we are unable to raise additional capital in sufficient amounts or on terms acceptable to us, we will need to curtail and reduce our operations and costs, and modify our business strategy which may require us to, among other things:

- significantly delay, scale back or discontinue the development or commercialization of one or more of our product candidates or one or more of our other research and development initiatives;
- seek collaborators for one or more of our current or future product candidates at an earlier stage than otherwise would be desirable or on terms that are less favorable than might otherwise be available;
- sell or license on unfavorable terms our rights to technologies or product candidates that we otherwise would seek to develop or commercialize ourselves; or
- cease operations.

We have incurred losses in nearly every year since our inception and we anticipate that we will not achieve sustained profits for the foreseeable future. To date, we have had no product revenues.

With the exception of the years ended December 31, 2006 and December 31, 2012, we have incurred losses each fiscal year since inception until December 31, 2018 and have not received any revenues other than from research and development

collaborations, royalties, license fees and milestone payments. From inception to December 31, 2018, we have an accumulated net deficit of $805.2 million. Investment in drug 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 continue to incur significant research, development and other expenses related to our ongoing operations including development of our product candidates. We do not expect to achieve sustained profits until such time as milestone payments, product sales and royalty payments, if any, generate sufficient revenues to fund our continuing operations. We cannot predict if we will ever achieve profitability and, if we do, we may not be able to remain consistently profitable or increase our profitability.

We expect to continue to incur significant expenses and increasing operating losses for the foreseeable future. We anticipate that our expenses will continue to be significant if and as we:

- continue our research and pre-clinical and clinical development of our product candidates;
- initiate additional pre-clinical, clinical or other studies or trials for our product candidates;
- continue or expand our licensing arrangements with our licensing partners;
- change or add additional manufacturers or suppliers;
- seek regulatory approvals for our product candidates that successfully complete clinical trials;
- establish a sales, marketing and distribution infrastructure to commercialize any products for which we may obtain regulatory approval;
- seek to identify and validate additional product candidates;
- acquire or in-license other product candidates and technologies;
- maintain, protect and expand our intellectual property portfolio;
- attract and retain skilled personnel;
- create additional infrastructure to support our product development and planned future commercialization efforts; and
- experience any delays or encounter issues with any of the above.

The net losses we incur may fluctuate significantly from quarter to quarter and year to year, such that a period-to-period comparison of our results of operations may not be a good indication of our future performance.

We do not generate revenues from product sales and may never be profitable.

Our ability to generate revenue and achieve profitability depends on our ability, alone or with strategic partners, to successfully complete the development of, and obtain the regulatory approvals necessary for, the manufacture and commercialization of our product candidates. We do not anticipate generating significant revenues from product sales for the foreseeable future, if ever. Our ability to generate future revenues from product sales depends heavily on our success in:

- completing research and pre-clinical and clinical development of our product candidates;
- seeking and obtaining regulatory approvals for product candidates for which we complete clinical trials;
- developing a sustainable, scalable, reproducible, and transferable manufacturing process for our product candidates;
- establishing and maintaining supply and manufacturing relationships with third parties that can provide adequate (in amount and quality) products and services to support clinical development and the market demand for our product candidates, if approved;
- launching and commercializing product candidates for which we obtain regulatory approval, either by collaborating with a partner or, if launched independently, by establishing a sales force, marketing, sales operations and distribution infrastructure;
- obtaining market acceptance of our product candidates as viable treatment options;
- addressing any competing technological and market developments;
- implementing additional internal systems and infrastructure, as needed;
- identifying and validating new product candidates;
- negotiating favorable terms in any collaboration, licensing or other arrangements into which we may enter;
- maintaining, protecting and expanding our portfolio of intellectual property rights, including patents, trade secrets and know-how; and

- attracting, hiring and retaining qualified personnel.

Even if one or more of the product candidates that we develop is approved for commercial sale, we anticipate incurring significant costs associated with commercializing any approved product candidate. Our expenses could increase beyond expectations if we are required by the FDA or other regulatory agencies, domestic or foreign, to perform clinical trials or other studies in addition to those that we currently anticipate. Even if we are able to generate revenues from the sale of any approved products, we may not become profitable and may need to obtain additional funding to continue operations.

We will seek to raise additional funds in the future, which may be dilutive to shareholders or impose operational restrictions.

We will need to raise additional capital in the future to help fund our pre-clinical studies, clinical trials and for the development and commercialization of our product candidates. If we raise additional capital through the issuance of equity securities, the percentage ownership of our current shareholders will be reduced. We may also issue equity as part of license issue fees to our licensors, to compensate consultants or to settle outstanding payables. Our shareholders may experience additional dilution in net book value per share and any additional equity securities may have rights, preferences and privileges senior to those of the holders of our common shares. Debt financing, if available, will result in increased fixed payment obligations and may involve agreements that include covenants limiting or restricting our ability to take specific actions, such as incurring additional debt, making capital expenditures or declaring dividends. Any debt financing or additional equity that we raise may contain terms, such as liquidation and other preferences, which are not favorable to us or our shareholders. If we raise additional funds through corporate collaboration, partnership or other strategic transactions, it may be necessary to relinquish valuable rights to our product candidates, our technologies or future revenue streams or to grant licenses or sell assets on terms that may not be favorable to us. If we cannot raise additional funds, we will have to delay our development activities or cease operations.

We may acquire other assets or businesses, or form collaborations or make investments in other companies or technologies that could harm our operating results, dilute our shareholders' ownership, incur debt or cause us to incur significant expense.

As part of our business strategy, we may pursue acquisitions of assets or businesses, or strategic alliances and collaborations, to expand our existing technologies and operations. We may not identify or complete these transactions in a timely manner, on a cost-effective basis, or at all, and we may not realize the anticipated benefits of any such transaction, any of which could have a detrimental effect on our financial condition, results of operations and cash flows. We may not be able to find suitable acquisition candidates, and if we make any acquisitions, we may not be able to integrate these acquisitions successfully into our existing business and we may incur debt or assume unknown or contingent liabilities in connection therewith. Integration of an acquired company or assets may also disrupt ongoing operations, require the hiring of additional personnel and the implementation of additional internal systems and infrastructure, especially the acquisition of commercial assets, and require management resources that would otherwise focus on developing our existing business. We may not be able to find suitable collaboration partners or identify other investment opportunities, and we may experience losses related to any such investments.

To finance any acquisitions or collaborations, we may choose to issue debt or equity securities as consideration. Any such issuance of shares would dilute the ownership of our shareholders. If the price of our common shares is low or volatile, we may not be able to acquire other assets or companies or fund a transaction using our equity securities as consideration. Alternatively, it may be necessary for us to raise additional capital for acquisitions through public or private financings. Additional capital may not be available on terms that are favorable to us, or at all.

Risks Related to Development, Clinical Testing, Regulatory Approval, Marketing, and Coverage and Reimbursement of our Product Candidates

Our product candidates are in early stages of development and must go through clinical trials, which are very expensive, time-consuming and difficult to design and implement.

Our research and development programs are at an early stage of development. We must demonstrate our product candidates' safety and efficacy in humans through extensive clinical testing. Such testing is expensive and time-consuming and requires specialized knowledge and expertise.

Clinical trials are expensive and difficult to design and implement, in part because they are subject to rigorous regulatory requirements. The clinical trial process is also time-consuming, and the outcome is not certain. We estimate that clinical trials of

our current product candidates will take multiple years to complete. Failure can occur at any stage of a clinical trial, and we could encounter problems that cause us to abandon or repeat clinical trials. The commencement and completion of clinical trials may be delayed or precluded by a number of factors, including:

- delay or failure in reaching agreement with the FDA or a foreign regulatory authority on the design of a given trial, or in obtaining authorization to commence a trial;
- delay or failure in reaching agreement on acceptable terms with prospective clinical research organizations ("CROs") and clinical trial sites;
- delay or failure in obtaining approval of an institutional review board ("IRB") before a clinical trial can be initiated at a given site;
- withdrawal of clinical trial sites from our clinical trials, including as a result of changing standards of care or the ineligibility of a site to participate;
- delay or failure in recruiting and enrolling patients in our clinical trials;
- delay or failure in having patients complete a clinical trial or return for post-treatment follow up;
- clinical sites or investigators deviating from trial protocol, failing to conduct the trial in accordance with applicable regulatory requirements, or dropping out of a trial;
- inability to identify and maintain a sufficient number of trial sites;
- failure of CROs to meet their contractual obligations or deadlines;
- the need to modify a trial protocol;
- unforeseen safety issues;
- emergence of dosing issues;
- lack of effectiveness during clinical trials;
- changes in the standard of care of the indication being studied;
- reliance on third-party suppliers for the clinical trial supply of product candidates;
- inability to monitor patients adequately during or after treatment;
- lack of sufficient funding to finance the clinical trials; and
- changes in governmental regulations or administrative action.

We, the FDA, or an IRB may suspend a clinical trial at any time for various reasons, including if it appears that the clinical trial is exposing participants to unacceptable health risks or if the FDA finds deficiencies in our IND application or the conduct of the trial. If we experience delays in the completion of, or the termination of, any clinical trial of our product candidates, the commercial prospects of our product candidates will be harmed, and our ability to generate product revenues from any of these product candidates will be delayed. In addition, any delays in completing our clinical trials will increase our costs, slow down our product candidate development and approval process, and jeopardize our ability to commence product sales and generate revenues. Any of these occurrences may harm our business, financial condition and prospects significantly. In addition, many of the factors that cause, or lead to, a delay in the commencement or completion of clinical trials may also ultimately lead to the denial of regulatory approval of our product candidates.

Pre-clinical studies and preliminary and interim data from clinical trials of our product candidates are not necessarily predictive of the results or success of ongoing or later clinical trials of our product candidates. If we cannot replicate the results from our pre-clinical studies and initial clinical trials of our product candidates in later clinical trials, we may be unable to successfully develop, obtain regulatory approval for and commercialize our product candidates.

Pre-clinical studies and any positive preliminary and interim data from our clinical trials of our product candidates may not necessarily be predictive of the results of ongoing or later clinical trials. A number of companies in the pharmaceutical and biotechnology industries, including us and many other companies with greater resources and experience than we, have suffered significant setbacks in clinical trials, even after seeing promising results in prior pre-clinical studies and clinical trials. Even if we are able to complete our planned clinical trials of our product candidates according to our current development timeline, initial positive results from pre-clinical studies and clinical trials of our product candidates may not be replicated in subsequent clinical trials. The design of our later stage clinical trials could differ in significant ways (e.g., inclusion and exclusion criteria, endpoints, statistical analysis plan) from our earlier stage clinical trials, which could cause the outcomes of the later stage trials to differ from those of our earlier stage clinical trials. If we fail to produce positive results in our planned clinical trials of any of our product candidates, the development timeline and regulatory approval and commercialization prospects for our product candidates, and, correspondingly, our business and financial prospects, would be materially adversely affected. If we fail to produce positive results in our planned clinical trials of any of our product candidates, the development

timeline and regulatory approval and commercialization prospects for our product candidates, and, correspondingly, our business and financial prospects, would be materially adversely affected.

Because we have limited resources, we may decide to pursue a particular product candidate and fail to advance product candidates that later demonstrate a greater chance of clinical and commercial success.

We are an early-stage company with limited resources and revenues. The product candidates we currently have under development will require significant development, pre-clinical and clinical testing and investment of significant funds before their commercialization. Because of this, we must make strategic decisions regarding resource allocations and which product candidates to pursue. There can be no assurance that we will be able to develop all potentially promising product candidates that we may identify. Based on preliminary results, we may choose to advance a particular product candidate that later fails to be successful, and simultaneously forgo or defer further investment in other product candidates that later are discovered to demonstrate greater promise in terms of clinical and commercial success. If we make resource allocation decisions that later are shown to be inaccurate, we could lose value rights, profits, or royalties related to the forgone or deferred product candidate.

Clinical trial results may fail to support approval of our product candidates.

Even if our clinical trials are successfully completed as planned, the results may not support approval of our product candidates under the laws and regulations of the FDA or a foreign regulatory authority. The clinical trial process may fail to demonstrate that our product candidates are both safe and effective for their intended uses. Pre-clinical and clinical data and analyses are often able to be interpreted in different ways. Even if we view our results favorably, if a regulatory authority has a different view, we may still fail to obtain regulatory approval of our product candidates. This, in turn, would significantly adversely affect our financial prospects.

Several of our current pre-clinical studies and clinical trials are being conducted outside the United States, and the FDA may not accept data from trials conducted in foreign locations.

Several of our current pre-clinical studies and clinical trials are being conducted outside the United States and we may conduct further pre-clinical studies and clinical trials outside the United States in the future. We are currently conducting clinical trials in Moldova, Thailand, South Korea, Hong-Kong, Poland, Spain and New Zealand. To the extent we do not conduct these clinical trials under an IND, the FDA may not accept data from such trials. Although the FDA may accept data from clinical trials conducted outside the United States that are not conducted under an IND, FDA's acceptance of these data is subject to certain conditions. For example, the clinical trial must be well designed and conducted and performed by qualified investigators in accordance with ethical principles. The trial population must also adequately represent the U.S. population, and the data must be applicable to the U.S. population and U.S. medical practice in ways that the FDA deems clinically meaningful. In general, the patient population for any clinical trials conducted outside of the United States must be representative of the population for whom we intend to label the product in the United States. In addition, while these clinical trials are subject to the applicable local laws, FDA acceptance of the data will be dependent upon its ability to verify the data and its determination that the trials also complied with all applicable U.S. laws and regulations. We cannot assure you that the FDA will accept data from trials conducted outside of the United States that are not conducted under an IND. If the FDA does not accept the data from such clinical trials, it would likely result in the need for additional trials, which would be costly and time-consuming and could delay or permanently halt our development of our product candidates.

We cannot guarantee how long it will take regulatory agencies to review our applications for product candidates, and we may fail to obtain the necessary regulatory approvals to market our product candidates.

Before we can commercialize our product candidates in the United States, we must obtain approval from the FDA. We must similarly obtain approvals from comparable regulatory authorities to commercial our product candidates in foreign jurisdictions.

To obtain marketing approval, U.S. laws require:

controlled research and human clinical testing;

- establishment of the safety and efficacy of the product for each use sought;
- government review and approval of a submission containing manufacturing, pre-clinical and clinical data;
- adherence to Good Manufacturing Practice Regulations during production and storage; and
- control of marketing activities, including advertising and labeling.

The process to review and approve a drug is time-consuming, unpredictable, and dependent on a variety of factors outside of our control. The approval process also requires a lot of financial and other resources, particularly for novel product candidates. The FDA and corresponding regulatory authorities in other jurisdictions have a significant amount of discretion in deciding whether or not to approve a marketing application. Our product candidates could fail to receive regulatory approval from the FDA or comparable foreign regulatory authority for several reasons, including:

- disagreement with the design or implementation of our clinical trials;
- failure to demonstrate that our candidate is safe and effective for the proposed indication;
- failure of clinical trial results to meet the level of statistical significance required for approval;
- failure to demonstrate that the product's benefits outweigh its risks;
- disagreement with our interpretation of pre-clinical or clinical data; and
- inadequacies in the manufacturing facilities or processes of third-party manufacturers.

The FDA or a comparable foreign authority may require us to conduct additional pre-clinical and clinical testing, which may delay or prevent approval and our commercialization plans or cause us to abandon the development program. Further, any approval we receive may be for fewer or more limited indications than we request, may not include labeling claims necessary for successful commercialization of the product candidate, or may be contingent upon our conducting costly post-marketing clinical trials. Any of these scenarios could materially harm the commercial prospects of a product candidate, and our operations will be adversely effected.

If a particular product candidate causes undesirable side effects, then we may be unable to receive regulatory approval of or commercialize our product candidate.

We may experience numerous unforeseen events during, or as a result of, the testing process that could delay or prevent commercialization of any products, including the occurrence of undesirable side effects. Such side effects could to clinical trial challenges, such as difficulties in patient recruitment, retention, and adherence, potential product liability claims, and possible termination by health authorities. As a result of such side effects and clinical trial challenges, the FDA or a comparable foreign authority to delay or deny regulatory approval of our product candidate. Side effects may also lead regulatory authorities to require stronger product warnings, costly post-marketing studies, and/or a Risk Evaluation and Mitigation Strategy ("REMS"), among other possible requirements. If the product candidate has already been approved, such approval may be withdrawn. Any delay in, denial, or withdrawal of marketing approval for one of our product candidates will adversely affect our financial position. Even if our product candidates receive marketing approval, undesirable side effects may limit the product's commercial viability. Patients may not wish to use our product, physicians may not prescribe our product, and our reputation may suffer. Any of these events may significantly harm our business and financial prospects.

Even if our product candidates obtain approval, they may be negatively impacted by future development or regulatory difficulties.

Approved products are subject to ongoing regulatory requirements and restrictions concerning manufacturing, quality control, further development, labeling, packaging, storage, distribution, safety surveillance, import, export, advertising, promotion, recordkeeping and reporting. If we or any of the third parties on which we rely fail to meet those requirements, it could lead to enforcement action, among other consequences, that could significantly impair our ability to successfully commercialize a given product. If the FDA or a comparable regulatory authority becomes aware of new safety information, it can impose additional restrictions on how the product is marketed or may seek to withdraw marketing approval altogether.

We may find it difficult to enroll patients in our clinical trials, which could delay or prevent clinical trials of our product candidates.

Identifying and qualifying patients to participate in clinical trials of our product candidates is critical to our success. The timing of our clinical trials depends in part on the speed at which we can recruit patients to participate in testing our product candidates. If patients are unwilling to participate in our clinical trials for a variety of reasons, including competitive clinical trials for similar patient populations, the timeline for recruiting patients, conducting clinical trials and obtaining regulatory approval of potential products may be delayed. These delays could result in increased costs, delays in advancing our product candidates, delays in testing the effectiveness of our technology or termination of the clinical trials altogether.

We may not be able to identify, recruit and enroll a sufficient number of patients, or those with required or desired characteristics to achieve diversity in a clinical trial, or complete our clinical trials in a timely manner. Patient enrollment is affected by a variety factors including, among others:

- severity of the disease under investigation;
- design of the trial protocol;
- prevalence of the disease/size of the patient population;
- eligibility criteria for the clinical trial in question;
- perceived risks and benefits of the product candidate under study;
- proximity and availability of clinical trial sites for prospective patients;
- availability of competing therapies and clinical trials;
- efforts to facilitate timely enrollment in clinical trials;
- patient referral practices of physicians; and
- ability to monitor patients adequately during and after treatment.

We are largely dependent on the future commercial success of our HBV product candidates.

Our ability to generate revenues and become profitable will depend in large part on the future commercial success of our HBV product candidates. If any product that we commercialize in the future does not gain an adequate level of acceptance among physicians, patients and third parties, we may not generate significant product revenues or become profitable. Market acceptance by physicians, patients and third party payors of the products we may commercialize will depend on a number of factors, some of which are beyond our control, including:

- their efficacy, safety and other potential advantages in relation to alternative treatments;
- their relative convenience and ease of administration;
- the availability of adequate coverage or reimbursement by third parties, such as insurance companies and other healthcare payors, and by government healthcare programs, including Medicare and Medicaid;
- the prevalence and severity of adverse events;
- their cost of treatment in relation to alternative treatments, including generic products;
- the extent and strength of our third party manufacturer and supplier support;
- the extent and strength of marketing and distribution support;
- the limitations or warnings contained in a product's FDA approved labeling; and
- distribution and use restrictions imposed by the FDA or that are part of a REMS or voluntary risk management plan.

For example, even if our products have been approved by the FDA, physicians and patients may not immediately be receptive to them and may be slow to adopt them. If our products do not achieve an adequate level of acceptance among physicians, patients and third party payors, we may not generate meaningful revenues and we may not become profitable.

We may incur substantial liabilities and may be required to limit commercialization of our products in response to product liability lawsuits.

The testing and marketing of medical products entail an inherent risk of product liability. Product liability claims may be brought against us by patients, healthcare providers or others using, administering or selling our products. Large judgments have been awarded in class action lawsuits based on drugs that had unanticipated side effects. If we cannot successfully defend ourselves against product liability claims, we may incur substantial liabilities or be required to limit commercialization of our products. Our inability to obtain sufficient product liability insurance at an acceptable cost to protect against potential product liability claims could prevent or inhibit the commercialization of pharmaceutical products we develop, alone or with partners. Although we currently have product liability insurance coverage for our clinical trials for expenses or losses, our insurance coverage is limited to $10 million per occurrence, and $10 million in the aggregate, and may not reimburse us or may not be sufficient to reimburse us for any or all 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. We intend to expand our insurance coverage to include the sale of commercial products if we obtain marketing approval for our product candidates in development, but we may be unable to obtain commercially reasonable product liability insurance for any products approved for marketing. Even if our agreements

with any current or future partners entitle us to indemnification against losses, such indemnification may not be available or adequate should any claims arise. A successful product liability claim or series of claims brought against us could cause our share price to fall and, if judgments exceed our insurance coverage, could decrease our cash and adversely affect our business.

If the market opportunities for our product candidates are smaller than we believe they are, our results of operations may be adversely affected and our business may suffer.

We focus our research and product development on treatments of chronic HBV. Our projections of the number of people who have chronic HBV are based on estimates. These estimates may prove to be incorrect and the number of patients in the U.S. and elsewhere may turn out to be lower than expected, may not be otherwise amenable to treatment with our products, or new patients may become increasingly difficult to identify or gain access to, all of which would adversely affect our results of operations and our business.

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, and continue to be, 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 Education Reconciliation Act, or 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 Affordable Care Act has substantially changed the way healthcare is financed by both governmental and private insurers and significantly affects the pharmaceutical industry. Additionally, the Drug Supply Chain Security Act, enacted in 2013, imposed new obligations on manufacturers of pharmaceutical products related to product tracking and tracing.

Some of the provisions of the Affordable Care Act have yet to be fully implemented, and certain provisions have been subject to judicial and Congressional challenges. In addition, there have been efforts by the Trump administration to repeal or replace certain aspects of the Affordable Care Act and to alter the implementation of the Affordable Care Act and related laws. For example, the Tax Cuts and Jobs Act (TCJA) enacted on December 22, 2017, eliminated the tax-based shared responsibility payment for individuals who fail to maintain minimum essential coverage under Section 5000A of the Internal Revenue Code of 1986, commonly referred to as the "individual mandate," effective January 1, 2019. Further, the Bipartisan Budget Act of 2018 among other things amended the Medicare statute, effective January 1, 2019, to reduce the coverage gap in most Medicare drug plans, commonly known as the "donut hole," by raising the manufacturer discount under the Medicare Part D coverage gap discount program to 70%. In addition, President Trump signed an Executive Order directing federal agencies with authorities and responsibilities under the Affordable Care Act to waive, defer, grant exemptions from, or delay the implementation of any provision of the Affordable Care Act that would impose a fiscal or regulatory burden on states, individuals, healthcare providers, health insurers, or manufacturers of pharmaceuticals or medical devices. On October 13, 2017, President Trump signed an Executive Order terminating the cost-sharing subsidies that reimburse insurers under the Affordable Care Act. Nineteen state Attorneys General filed suit to stop the administration from terminating the subsidies, but on July 18, 2018, the U.S. District Court for the Northern District of California dismissed the case without prejudice. In addition, the Centers for Medicare and Medicaid Services has recently proposed regulations that would give states greater flexibility in setting benchmarks for insurers in the individual and small group marketplaces, which may have the effect of relaxing the essential health benefits required under the Affordable Care Act for plans sold through such marketplaces. Additional legislative changes, regulatory changes, and judicial challenges related to the Affordable Care Act remain possible. The implications of the Affordable Care Act, and efforts to repeal and replace, or invalidate, the Affordable Care Act, or portions thereof, or the political uncertainty surrounding any repeal or replacement legislation for our business and financial condition, if any, are not yet clear.

We cannot predict what healthcare reform initiatives may be adopted in the future. Further federal and state legislative and regulatory developments are likely, and we expect ongoing initiatives in the United States to increase pressure on drug pricing. Such reforms could have an adverse effect on anticipated revenues from product candidates that we may successfully develop and for which we may obtain regulatory approval and may affect our overall financial condition and ability to develop product candidates.

Legislative and regulatory proposals have also been made to expand post approval requirements and restrict sales and promotional activities for pharmaceutical products. Any healthcare reforms enacted in the future may, like the Affordable Care Act, be phased in over a number of years but, if enacted, could reduce our revenue, increase our costs, or require us to revise the ways in which we conduct business or put us at risk for loss of business. We are not sure whether additional legislative changes will be enacted, or whether the current regulations, guidance or interpretations will be changed, or what the impact of such changes on our business, if any, may be.

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

Market acceptance and sales of any product candidates that we develop will depend in part on the extent to which reimbursement for these products and related treatments will be available from third party payors, including government health administration authorities and private health insurers. Third party payors decide which drugs they will pay for and establish reimbursement levels. Third party payors often rely upon Medicare coverage policy and payment limitations in setting their own reimbursement policies. However, decisions regarding the extent of coverage and amount of reimbursement to be provided for each of our product candidates will be made on a plan by plan basis. 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 does not imply that an adequate reimbursement rate will be approved. Each plan determines whether or not it will provide coverage for a drug, what amount it will pay the manufacturer for the drug, and on what tier of its formulary the drug will be placed. The position of a drug on a formulary generally determines the copayment 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 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.

A primary trend in the U.S. healthcare industry and elsewhere is cost containment. Third party payors have attempted to control costs by limiting 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 and reimbursement may impact the demand for, or the price of, any product for which we obtain marketing approval. If coverage and adequate reimbursement is not available, or is available only to limited levels, we may not be able to successfully commercialize any product candidates that we develop.

Additionally, there have been a number of legislative and regulatory proposals to change the healthcare system in the United States and in some foreign jurisdictions that could affect our ability to sell any future products profitably. These legislative and regulatory changes may negatively impact the reimbursement for any future products, following approval.

If we are able to successfully commercialize any of our products and if we participate in the Medicaid Drug Rebate Program or other governmental pricing programs, failure to comply with reporting and payment obligations under these programs could result in additional reimbursement requirements, penalties, sanctions and fines which could have a material adverse effect on our business, financial condition, results of operations and growth prospects.

If we successfully commercialize any of our products, we may participate in the Medicaid Drug Rebate Program. Participation is required for federal funds to be available for our products under Medicaid and Medicare Part B. Under the Medicaid Drug Rebate Program, we would be required to pay a rebate to each state Medicaid program for our covered outpatient drugs that are dispensed to Medicaid beneficiaries and paid for by a state Medicaid program as a condition of having federal funds being made available to the states for our drugs under Medicaid and Part B of the Medicare program.

Federal law requires that any company that participates in the Medicaid Drug Rebate Program also participate in the Public Health Service’s 340B drug pricing program in order for federal funds to be available for the manufacturer’s drugs under Medicaid and Medicare Part B. The 340B program requires participating manufacturers to agree to charge statutorily-defined covered entities no more than the 340B “ceiling price” for the manufacturer’s covered outpatient drugs. These 340B covered entities include a variety of community health clinics and other entities that receive health services grants from the Public Health Service, as well as hospitals that serve a disproportionate share of low-income patients.

In addition, in order to be eligible to have its products paid for with federal funds under the Medicaid and Medicare Part B programs and purchased by certain federal agencies and grantees, a manufacturer also must participate in the FSS pricing program, established by Section 603 of the VHCA. Under this program, the manufacturer is obligated to make its covered drugs available for procurement on an FSS contract and charge a price to the Big Four agencies that is no higher than the statutory

Federal Ceiling Price. Moreover, pursuant to DHA regulations, manufacturers must provide rebates on utilization of their covered drugs that are dispensed to TRICARE beneficiaries by TRICARE network retail pharmacies. The formula for determining the rebate is established in the regulations and is based on the difference between the annual Non-FAMP and the FCP in effect on the dispense date (these price points are required to be calculated by us under the VHCA). The requirements under the Medicaid Drug Rebate Program, 340B program, FSS, and TRICARE programs could reduce the revenue we may generate from any products that are commercialized in the future and could adversely affect our business and operating results.

The Medicaid Drug Rebate Program and other governmental pricing programs require participating manufacturers to report pricing data to the government. Pricing calculations vary among products and programs and include average manufacturer price and best price for the Medicaid Drug Rebate Program, and FCP and non-FAMP for the FSS pricing program.

If we successfully commercialize any of our products and participate in such governmental pricing programs, we will be liable for errors associated with our submission of pricing data. That liability could be significant. Pricing submissions and rebate calculations are complex and are often subject to interpretation by us, governmental or regulatory agencies and the courts. If we fail to comply with any applicable reporting and payment obligations under governmental pricing programs that we participate in, we could be subject to additional reimbursement requirements, significant civil monetary penalties, sanctions and fines, and those could negatively impact our business, financial condition, results of operations and growth prospects. Any threatened or actual government enforcement action could also generate adverse publicity and require that we devote substantial resources that could otherwise be used in other aspects of our business. We cannot assure you that our submissions would not be found by the applicable governmental agency to be incomplete or incorrect.

We are subject to U.S. and Canadian healthcare laws and regulations, which could expose us to criminal sanctions, civil penalties, contractual damages, reputational harm, fines, disgorgement, exclusion from participation in government healthcare programs, curtailment or restricting of our operations and diminished profits and future earnings.

Healthcare providers, physicians and others will play a primary role in the recommendation and prescription of any products for which we obtain marketing approval. Our future arrangements with healthcare providers, patients and third party payors will expose us to broadly applicable U.S. and Canadian fraud and abuse and other healthcare laws and regulations that may constrain the business or financial arrangements and collaborative partners through which we market, sell and distribute any products for which we obtain marketing approval. Restrictions under applicable federal and state healthcare laws and regulations include the following:

- the federal Anti-Kickback Law prohibits persons from, among other things, 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, the referral of an individual for the furnishing or arranging for the furnishing, or the purchase, lease or order, or arranging for or recommending purchase, lease or order, any good or service for which payment may be made under a federal healthcare program such as Medicare and Medicaid;

- the federal civil False Claims Act imposes penalties, including through civil whistleblower or qui tam actions, against individuals or entities for, among other things, knowingly presenting, or causing to be presented, to the federal government, claims for payment that are false or fraudulent or making a false statement material to an obligation to pay money to the government or knowingly concealing or knowingly and improperly avoiding, decreasing, or concealing an obligation to pay money to the federal government;

- HIPAA imposes criminal liability for knowingly and willfully executing a scheme to defraud any healthcare benefit program, knowingly and willfully embezzling or stealing from a health care benefit program, willfully obstructing a criminal investigation of a health care offense, or knowingly and willfully making false statements relating to healthcare matters;

- HIPAA and its implementing regulations also impose obligations on certain covered entity health care providers, health plans and health care clearinghouses as well as their business associates that perform certain services involving the use or disclosure of individually identifiable health information, including mandatory contractual terms, with respect to safeguarding the privacy, security and transmission of individually identifiable health information. We may obtain health information from third parties (including research institutions from which we obtain clinical trial data) that are subject to privacy and security requirements under HIPAA. Although we are not directly subject to HIPAA - other than with respect to providing certain employee benefits - we could potentially be subject to criminal penalties if we, our affiliates, or our agents

knowingly obtain, use, or disclose individually identifiable health information maintained by a HIPAA-covered entity in a manner that is not authorized or permitted by HIPAA. ;

- the federal Physician Payment Sunshine Act, being implemented as the Open Payments Program, which requires 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 CMS information related to direct or indirect payments and other transfers of value to physicians and teaching hospitals (and certain other practitioners beginning in 2022), as well as ownership and investment interests held in the company by physicians and their immediate family members; and

- analogous state and foreign laws and regulations, such as state anti-kickback and false claims laws, which may apply to sales or marketing arrangements and claims involving healthcare items or services reimbursed by non-governmental third-party payors, including private insurers; state and foreign 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 or otherwise restrict payments that may be made to certain healthcare providers; state and foreign laws that require drug manufacturers to report information related to clinical trials, or information related to payments and other transfers of value to physicians and other healthcare providers or marketing expenditures; state laws that restrict the ability of manufacturers to offer co-pay support to patients for certain prescription drugs; state laws and local ordinances that require identification or licensing of sales representatives; and state and foreign laws that govern the privacy and security of health information in certain circumstances, many of which differ from each other in significant ways and often are not preempted by HIPAA, thus complicating compliance efforts.

Efforts to ensure that our collaborations with third parties, and our business generally, will comply with applicable U.S. and Canadian healthcare laws and regulations will involve substantial costs. It is possible that governmental authorities will conclude that our business practices may not comply with current or future statutes, regulations or case law involving applicable fraud and abuse or other healthcare laws and regulations. If our operations are found to be in violation of any of these laws or any other governmental laws and regulations that may apply to us, we may be subject to significant civil, criminal and administrative penalties, damages, fines, imprisonment, exclusion of products from government funded healthcare programs, contractual damages, reputational harm, disgorgement, curtailment or restricting of our operations, any of which could substantially disrupt our operations and diminish our profits and future earnings. If any of the physicians or other providers or entities with whom we expect to do business is found not to be in compliance with applicable laws, they may be subject to criminal, civil or administrative sanctions, including exclusions from government funded healthcare programs. The risk of our being found in violation of these laws is increased by the fact that many of them have not been fully interpreted by the regulatory authorities or the courts, and their provisions are open to a variety of interpretations.

Failure to comply with the U.S. Foreign Corrupt Practices Act ("FCPA") could subject us to penalties and other adverse consequences.

We are subject to the FCPA, which generally prohibits U.S. companies from engaging in bribery or other prohibited payments to foreign officials for the purpose of obtaining or retaining business and requires companies to maintain accurate books and records and internal controls, including at foreign-controlled subsidiaries.

Compliance with the FCPA may be expensive and difficult, particularly in countries in which corruption is a recognized problem. In addition, the FCPA presents particular challenges in the pharmaceutical industry, because, in many countries, hospitals are operated by the government, and physicians and other hospital employees are considered to be foreign officials. Certain payments to hospitals in connection with clinical trials and other work have been deemed to be improper payments to governmental officials and have led to FCPA enforcement actions.

We can make no assurance that our employees or other agents will not engage in prohibited conduct under our policies and procedures and FCPA for which we might be held responsible. If our employees or other agents are found to have engaged in such practices, we could suffer severe penalties and other consequences that may have a material adverse effect on our business, financial condition and results of operations.

Risks Related to Our Dependence on Third Parties

We depend on our license agreement with Alnylam for the commercialization of Onpattro.

In 2012, we entered into a license agreement with Alnylam that entitles Alnylam to develop and commercialize products with our LNP technology. Alnylam received FDA approval in August 2018 and launched Onpattro immediately upon approval. We are entitled to low to mid single-digit royalty payments escalating based on sales performance and received our first royalty payment in the fourth quarter of 2018. The amount and timing of any revenues we receive from Alnylam will be affected by many factors including:

- Alnylam's and its distributors' and sublicensees' ability to effectively market and sell Onpattro in each country where sold;
- the manner of sale, whether directly by Alnylam or by sublicensees or distributors, and the terms of sublicensing and distribution agreements;
- the amount and timing of sales of Alnylam in each country;
- regulatory approvals, appropriate labeling, and desirable pricing, insurance coverage and reimbursement;
- competition; and
- commencement of marketing in additional countries; and

If Alnylam is not successful in commercializing Onpattro, it would adversely affect our business, operating results and financial condition.

We expect to depend in part on our licensing agreements for a significant portion of our revenues and to develop, conduct clinical trials with, obtain regulatory approvals for, and manufacture, market and sell some of our product candidates. If these licensing agreements are unsuccessful, or anticipated milestone or royalty payments are not received, our business could be adversely affected.

We expect that we will depend in part on our licensing agreements with Alnylam, Gritstone, and Spectrum to provide revenue to partially fund our operations, especially in the near term. Furthermore, our strategy is to enter into various additional arrangements with corporate and academic collaborators, licensors, licensees and others for the research, development, clinical testing, manufacturing, marketing and commercialization of our product candidates or other products based upon our technology. We may be unable to continue to establish such licensing agreements, and any licensing agreements we do establish may be unsuccessful, or we may not receive milestone payments or royalties as anticipated.

Should any licensing partner fail to develop or ultimately successfully commercialize any of the product candidates or technology to which it has obtained rights, our business may be adversely affected. In addition, once initiated, there can be no assurance that any of these licensing agreements will be continued or result in successfully commercialized products. Failure of a licensing partner to continue funding any particular program could delay or halt the development or commercialization of any products arising out of such program. In addition, there can be no assurance that the licensing partners will not pursue alternative technologies or develop alternative products either on their own or in collaboration with others, including our competitors.

If conflicts arise between our licensing partners and us, our licensing partners may act in their best interest and not in our best interest, which could adversely affect our business.

Conflicts may arise with our licensing partners, including Alnylam, Gritstone, and Spectrum, if they pursue alternative therapies for the diseases that we have targeted or develop alternative products either on their own or in collaboration with others. Competing products, either developed by our present licensing partners or any future partners or to which our present partners or any future partners have rights, may result in development delays or the withdrawal of their support for one or more of our product candidates.

Additionally, conflicts may arise if there is a dispute about the progress of, or other activities related to, the clinical development of a product candidate, the achievement and payment of a milestone amount, the payment of royalties or the ownership of intellectual property that is developed during the course of the collaborative arrangement. Similarly, the parties to a licensing agreement may disagree as to which party owns newly developed products. If an agreement is terminated as a result of a dispute and before we have realized the benefits of the licensing arrangement, our reputation could be harmed and we might not obtain revenues that we anticipated receiving.

We rely on third parties to conduct our clinical trials, and if they fail to fulfill their obligations, perform services in a satisfactory manner, and/or comply with applicable legal or regulatory requirements, our development plans may be adversely affected.

We rely on independent clinical investigators, contract research organizations and other third-party service providers to assist us in managing, monitoring and otherwise carrying out our clinical trials. We have contracted with, and we plan to continue to contract with, certain third parties to provide certain services, including site selection, enrollment, monitoring and data management services. Although we depend heavily on these parties and have contractual agreements governing their activities, we do not control them and therefore, we cannot be assured that these third parties will adequately perform all of their contractual obligations to us. If our third-party service providers cannot adequately fulfill their obligations to us on a timely and satisfactory basis or if the quality or accuracy of our clinical trial data is compromised due to failure to adhere to our protocols or regulatory requirements, or if such third parties otherwise fail to meet deadlines or follow legal or regulatory requirements, our development plans may be delayed or terminated.

We rely exclusively on third parties to formulate and manufacture our product candidates, which exposes us to a number of risks that may delay development, regulatory approval and commercialization of our products or result in higher product costs.

We have no experience in drug formulation or manufacturing and we lack the resources and expertise to formulate or manufacture our own product candidates internally. Therefore, we rely on third-party expertise to support us in this area. We have entered into contracts with third-party manufacturers to manufacture, supply, store and distribute supplies of our product candidates for our clinical trials. If any of our product candidates receives FDA approval, we expect to rely on third-party contractors to manufacture our drugs. We have no current plans to build internal manufacturing capacity for any product candidate, and we have no long-term supply arrangements.

Our reliance on third-party manufacturers exposes us to potential risks, such as the following:

- we may be unable to contract with third-party manufacturers on acceptable terms, or at all, because the number of potential manufacturers is limited. Potential manufacturers of any product candidate that is approved will be subject to FDA compliance inspections and any new manufacturer would have to be qualified to produce our products;
- our third-party manufacturers might be unable to formulate and manufacture our drugs in the volume and of the quality required to meet our clinical and commercial needs, if any;
- our third-party manufacturers may not perform as agreed or may not remain in the contract manufacturing business for the time required to supply our clinical trials through completion or to successfully produce, store and distribute our commercial products, if approved;
- drug manufacturers are subject to ongoing periodic unannounced inspection by the FDA and other government agencies to ensure compliance with cGMP and other government regulations and corresponding foreign standards. We do not have control over third-party manufacturers' compliance with these regulations and standards, but we may ultimately be responsible for any of their failures;
- if any third-party manufacturer makes improvements in the manufacturing process for our products, we may not own, or may have to share, the intellectual property rights to such improvements; and
- a third-party manufacturer may gain knowledge from working with us that could be used to supply one of our competitors with a product that competes with ours.

Each of these risks could delay or have other adverse impacts on our clinical trials and the approval and commercialization of our product candidates, potentially resulting in higher costs, reduced revenues or both.

We have no experience selling, marketing or distributing drug products and currently have no internal capability to do so.

We currently have no sales, marketing or distribution capabilities. While we intend to have a role in the commercialization of our product candidates, if approved, we do not anticipate having the resources in the foreseeable future to develop global sales and marketing capabilities for all of our proposed products. Our future success depends, in part, on our ability to enter into and maintain collaborative relationships with other companies that have sales, marketing and distribution capabilities, a strategic interest in the products under development, and the ability to successfully market and sell our products.

To the extent that we decide not to, or are unable to, enter into collaborative arrangements with respect to the sales and marketing of our proposed products, significant capital expenditures, management resources and time will be required to establish and develop an in-house marketing and sales force with the necessary expertise. We cannot assure you that we will be able to establish or maintain relationships with third-party collaborators or develop in-house sales and distribution capabilities. To the extent that we depend on third parties for marketing and distribution, any revenues we receive will depend upon the efforts of such third parties, as well as the terms of our agreements with such third parties, which cannot be predicted at this early stage of our development. We cannot assure you that such efforts will be successful. In addition, we cannot assure you that we will be able to market and sell our products in the United States or the rest of world.

Risks Related to Patents, Licenses and Trade Secrets

Other companies or organizations may assert patent rights that prevent us from developing or commercializing our products.

RNA interference, capsid inhibitors and RNA destabilizer, as well as our other novel HBV assets, are relatively new scientific fields that have generated many different patent applications from organizations and individuals seeking to obtain patents in the field. These applications claim many different methods, compositions and processes relating to the discovery, development and commercialization of these therapeutic products. Because the field is so new, very few of these patent applications have been fully processed by government patent offices around the world, and there is a great deal of uncertainty about which patents will be issued, when, to whom, and with what claims. It is likely that there could be litigation and other proceedings, such as interference and opposition proceedings in various patent offices, relating to patent rights in RNAi, capsid inhibitors, RNA destabilizer and other small molecule compounds targeted at HBV.

In addition, there are many issued and pending patents that claim aspects of RNAi trigger chemistry technology that we may need to apply to our product candidates. There are also many issued patents that claim genes or portions of genes that may be relevant for RNAi trigger product candidates we wish to develop. Thus, it is possible that one or more organizations will hold patent rights to which we will need a license. If those organizations refuse to grant us a license to such patent rights on reasonable terms, we will not be able to market products or perform research and development or other activities covered by these patents.

Our patents and patent applications may be challenged and may be found to be invalid, which could adversely affect our business.

Certain Canadian, U.S. and international patents and patent applications we own involve complex legal and factual questions for which important legal principles are largely unresolved. For example, no consistent policy has emerged for the breadth of biotechnology patent claims that are granted by the U.S. Patent and Trademark Office or enforced by the U.S. federal courts. In addition, the coverage claimed in a patent application can be significantly reduced before a patent is issued. Also, we face the following intellectual property risks:

- some or all patent applications may not result in the issuance of a patent;
- patents issued may not provide the holder with any competitive advantages;
- patents could be challenged by third parties;
- the patents of others, including Alnylam, could impede our ability to do business;
- competitors may find ways to design around our patents; and
- competitors could independently develop products which duplicate our products.

A number of industry competitors and institutions have developed technologies, filed patent applications or received patents on various technologies that may be related to or affect our business. Some of these technologies, applications or patents may conflict with our technologies or patent applications. Such conflict could limit the scope of the patents, if any, that we may be able to obtain or result in the denial of our patent applications. In addition, if patents that cover our activities are issued to other companies, there can be no assurance that we would be able to obtain licenses to these patents at a reasonable cost or be able to develop or obtain alternative technology. If we do not obtain such licenses, we could encounter delays in the introduction of products, or could find that the development, manufacture or sale of products requiring such licenses is prohibited. In addition, we could incur substantial costs in defending patent infringement suits brought against us or in filing suits against others to have such patents declared invalid. As publication of discoveries in the scientific or patent literature often lags behind actual discoveries, we cannot be certain we or any licensor was the first creator of inventions covered by pending patent applications or that we or such licensor was the first to file patent applications for such inventions. Any future proceedings could result in substantial costs, even if the eventual outcomes are favorable. There can be no assurance that our patents, if issued, will be held valid or enforceable by a court or that a competitor's technology or product would be found to infringe such patents.

Our business depends, in part, on our ability to use RNAi technology that we have licensed or will in the future license from third parties, including Alnylam, and, if these licenses were terminated or if we were unable to license additional technology we may need in the future, our business will be adversely affected.

We currently hold licenses for certain technologies that are or may be applicable to our current and subsequent product candidates. These include a license to patents held or applied for by Alnylam and a license to UNA technology from Arcturus Therapeutics. The licenses are subject to termination in the event of a breach by us of the license, if we fail to cure the breach following notice and the passage of a cure period. The UBC license, which is sublicensed to Alnylam, is subject to termination with respect to one or more particular patents if we and Alnylam were to cease patent prosecution or maintenance activities with respect to such patent(s), or in the event of a breach by us of the license, if we fail to cure the breach following notice and the passage of a cure period. There can be no assurance that these licenses will not be terminated. We may need to acquire additional licenses in the future to technologies developed by others, including Alnylam. For example, Alnylam has granted us a worldwide license for the discovery, development and commercialization of RNAi products directed to thirteen gene targets (three exclusive and ten non-exclusive licenses). Licenses for the five non-exclusive targets and one exclusive target have already been granted. We have rights to select the gene targets for up to two more exclusive licenses and five more nonexclusive licenses from Alnylam, which would be made available to us only if they have not been previously selected by Alnylam or one of its other partners. This will limit the targets available for selection by us, and we may never be able to select gene targets or may be required to make our selection from gene targets that have minimal commercial potential. Furthermore, future license agreements may require us to make substantial milestone payments. We will also be obligated to make royalty payments on the sales, if any, of products resulting from licensed RNAi technology. For some of our licensed RNAi technology, we are responsible for the costs of filing and prosecuting patent applications. The termination of a license or the inability to license future technologies on acceptable terms may adversely affect our ability to develop or sell our products.

Our business depends, in part, on our ability to use the technology that we have licensed or will in the future license from third parties, including Blumberg, and, if these licenses were terminated or if we were unable to license additional technology we may need in the future, our business will be adversely affected.

We have licensed certain of our intellectual property from Blumberg. Our current technology licenses are important to our business and we expect to enter into additional licenses in the future. If we fail to comply with our obligations under these agreements or any future license agreements, we may be subject to a bankruptcy, or if we grant a sublicense in the future and our sublicense does not comply with our obligations under these agreements or becomes subject to a bankruptcy, the licensor may have the right to terminate the license, in which event we would not be able to develop or market products covered by the license or may face other penalties under the agreements, which could have a materially adverse effect on our business. In addition, applicable laws involving bankruptcy or similar proceeding by licensors in some jurisdictions outside the United States may provide the trustee or receiver in such proceeding with the right to set aside or otherwise terminate or seek to modify the license. Any termination of these agreements or reduction or elimination of our rights under these agreements may result in our having to negotiate new or amended agreements with less favorable terms, or cause us to lose our rights under these agreements, including our rights to important intellectual property and technologies that form the basis of our technology, which may then be in licensed by one or more of our competitors.

We may incur substantial costs as a result of litigation or other proceedings relating to patent and other intellectual property rights which could have a material adverse effect on our business, financial condition and results of operations and could cause the market value of our common shares to decline.

There has been significant litigation in the biotechnology industry over contractual obligations, patents and other proprietary rights, and we may become involved in various types of litigation that arise from time to time. Involvement in litigation could consume a substantial portion of our resources, regardless of the outcome of the litigation. Counterparties in litigation may be better able to sustain the costs of litigation because they have substantially greater resources. If claims against us are successful, in addition to any potential liability for damages, we could be required to obtain a license, grant cross-licenses, and pay substantial milestones or royalties in order to continue to develop, manufacture or market the affected products. Involvement and continuation of involvement in litigation may result in significant and unsustainable expense, and divert management's attention from ongoing business concerns and interfere with our normal operations. Litigation is also inherently uncertain with respect to the time and expenses associated therewith, and involves risks and uncertainties in the litigation process itself, such as discovery of new evidence or acceptance of unanticipated or novel legal theories, changes in interpretation of the law due to decisions in other cases, the inherent difficulty in predicting the decisions of judges and juries and the possibility of appeals. Ultimately we could be prevented from commercializing a product or be forced to cease some aspect of our business operations as a result of claims of patent infringement or violation of other intellectual property rights and the costs associated with litigation, which could have a material adverse effect on our business, financial condition, and operating results and could cause the market value of our common shares to decline.

Confidentiality agreements with employees and others, including collaborators, may not adequately prevent disclosure of trade secrets and other proprietary information.

Much of our know-how and technology may constitute trade secrets. There can be no assurance, however, that we will be able to meaningfully protect our trade secrets. In order to protect our proprietary technology and processes, we rely in part on confidentiality agreements with our collaborators, employees, vendors, consultants, outside scientific collaborators and sponsored researchers, and other advisors. These agreements may not effectively prevent disclosure of confidential information and may not provide an adequate remedy in the event of unauthorized disclosure of confidential information. In addition, others may independently discover trade secrets and proprietary information, and in such cases we could not assert any trade secret rights against such party. Costly and time consuming litigation could continue to be necessary to enforce and determine the scope of our proprietary rights, and failure to obtain or maintain trade secret protection could adversely affect our competitive business position.

We have licensed important portions of our intellectual property from Blumberg and Drexel, and are subject to significant obligations under those license agreements.

The rights we hold under our license agreements with Blumberg and Drexel are important to our business. Our discovery and development platform is built, in part, around patents exclusively in licensed from these parties.

We have licenses with Blumberg and Drexel, both directly and through its acquisition of Enantigen, that grant us the exclusive (except in some cases as to know how that is not unique or specific to the licensed products or compound series, which are non-exclusive and subject to retained rights for non-commercial research use), worldwide license to make, have made, use, import, offer for sale and sell products incorporating one or more licensed compounds, which include capsid assembly inhibitors, inhibitors of secretion of HBV antigens, cccDNA inhibitors and hepatocellular carcinoma inhibitors, either for general use in humans or for use in the field of HBV research, diagnosis and treatment.

Under our agreements with Blumberg and Drexel, we are subject to significant obligations, including diligence obligations with respect to development and commercialization activities, payment obligations upon achievement of certain milestones and royalties on product sales, as well as other material obligations. Under our direct agreement with Blumberg and Drexel, we agreed to pay up to $3.5 million in development and regulatory milestones per licensed compound series, up to $92.5 million in sales performance milestones per licensed product, and royalties in the mid-single digits in connection with the sale of licensed products. Under each of the three license agreements that our subsidiary, Enantigen, has with Blumberg and Drexel, we are obligated to pay up to $0.5 million in development and regulatory milestones per licensed product and royalties in the low single digits in connection with the sale of licensed products. If payments become due under the terms of the agreements, we may be negatively affected.

If there is any conflict, dispute, disagreement or issue of non-performance between us and Blumberg and Drexel regarding our rights or obligations under these license agreements, including any conflict, dispute or disagreement arising from our failure to satisfy diligence or payment obligations under such agreements, Blumberg and Drexel may have a right to terminate the license. The loss of any of these license agreements could materially and adversely affect our ability to use intellectual property that could be critical to our drug discovery and development efforts, as well as our ability to enter into future collaboration, licensing and/or marketing agreements for one or more affected product candidates or development programs.

Some of our licensors have retained rights to develop and commercialize certain of our product candidates to treat diseases other than HBV and, as a result, our development and commercialization efforts may be negatively affected.

Our license agreements provide us with the rights to develop and commercialize our product candidates for HBV; however, some of our licensors have retained rights to develop and commercialize certain of its product candidates to treat diseases other than HBV, and to license those rights to other third parties.

Risks Related to Competition

The pharmaceutical market is intensely competitive. If we are unable to compete effectively with existing drugs, new treatment methods and new technologies, we may be unable to successfully commercialize any product candidates that we develop.

The pharmaceutical market is intensely competitive and rapidly changing. Many large pharmaceutical and biotechnology companies, academic institutions, governmental agencies and other public and private research organizations are pursuing the development of novel drugs for the same diseases that we are targeting or expect to target. Many of our competitors have:

- much greater financial, technical and human resources than we have at every stage of the discovery, development, manufacture and commercialization process;
- more extensive experience in pre-clinical testing, conducting clinical trials, obtaining regulatory approvals, and in manufacturing, marketing and selling pharmaceutical products;
- product candidates that are based on previously tested or accepted technologies;
- products that have been approved or are in late stages of development; and
- collaborative arrangements in our target markets with leading companies and research institutions.

We will face intense competition from products that have already been approved and accepted by the medical community for the treatment of the conditions for which we are currently developing products. We also expect to face competition from new products that enter the market. We believe a significant number of products are currently under development, and may become commercially available in the future, for the treatment of conditions for which we may try to develop products. These products, or other of our competitors' products, may be more effective, safer, less expensive or marketed and sold more effectively than any products we develop.

We face significant competition from other biotechnology and pharmaceutical companies targeting HBV.

As a significant unmet medical need exists for HBV, there are several large and small pharmaceutical companies focused on delivering therapeutics for treatment of HBV. These companies include Gilead Sciences, Johnson and Johnson, Assembly Biosciences, Roche, Replicor, Spring Bank, Alnylam, Arrowhead, ContraVir, Dicerna, Intellia, Cocrystal, and Enanta. Further, it is likely that additional drugs will become available in the future for the treatment of HBV.

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.

We anticipate significant competition in the HBV market with several early phase product candidates announced. We will also face competition for other product candidates that we expect to develop in the future. Competition may increase further as a result of advances in the commercial applicability of technologies and greater availability of capital for investment

in these industries. Our competitors may succeed in developing, acquiring or licensing, on an exclusive basis, product candidates that are more effective or less costly than any product candidate that we may develop.

If we successfully develop product candidates, and obtain approval for them, we will face competition based on many different factors, including the following:

- safety and effectiveness of our products;
- ease with which our products can be administered and the extent to which patients and physicians accept new routes of administration;
- timing and scope of regulatory approvals for these products;
- availability and cost of manufacturing, marketing and sales capabilities;
- price;
- reimbursement coverage; and
- patent position.

Our competitors may develop or commercialize products with significant advantages over any products we develop based on any of the factors listed above or on other factors. Our competitors may therefore be more successful in commercializing their products than we are, which could adversely affect our competitive position and business. Competitive products may make any products we develop obsolete or uncompetitive before we can recover the expenses of developing and commercializing our product candidates. Such competitors could also recruit our employees, which could negatively impact our level of expertise and the ability to execute on our business plan. Furthermore, we also face competition from existing and new treatment methods that reduce or eliminate the need for drugs, such as the use of advanced medical devices. The development of new medical devices or other treatment methods for the diseases we are targeting and may target could make our product candidates non-competitive, obsolete or uneconomical.

Risks Related to Managing our Operations

If we are unable to attract and retain qualified key management, scientific staff, consultants and advisors, our ability to implement our business plan may be adversely affected.

We depend upon our senior executive officers as well as key scientific, management and other personnel. The competition for qualified personnel in the biotechnology field is intense. We rely heavily on our ability to attract and retain qualified managerial, scientific and technical staff. The loss of the service of any of the members of our senior management, including Dr. Mark Murray, our President and Chief Executive Officer, and Michael J. Sofia, our Chief Scientific Officer, may adversely affect our ability to develop our technology, add to our pipeline, advance our product candidates and manage our operations. We do not carry key person life insurance on any of our employees.

We rely on consultants and advisors, including scientific and clinical advisors, to assist us in formulating our research and development and commercialization strategy. Our consultants and advisors may be employed by other entities and may have commitments under consulting or advisory contracts with those entities that may limit their availability to us. If we are unable to continue to attract and retain highly qualified personnel, our ability to develop and commercialize our product candidates will be limited.

We may have difficulty managing our growth and expanding our operations successfully as we continue to evolve from a company primarily involved in discovery and pre-clinical testing into one that develops products through clinical development and commercialization.

As product candidates we develop enter and advance through clinical trials, we will need to expand our development, regulatory, manufacturing, clinical and medical capabilities or contract with other organizations to provide these capabilities for us. As our operations expand, we expect that we will need to manage additional relationships with various collaborators, suppliers and other organizations. Our ability to manage our operations and growth will require us to continue to improve our operational, financial and management controls, reporting systems and procedures. We may not be able to implement improvements to our management information and control systems in an efficient or timely manner and may discover deficiencies in existing systems or controls.

We could face liability from our controlled use of hazardous and radioactive materials in our research and development processes.

We use certain radioactive materials, biological materials and chemicals, including organic solvents, acids and gases stored under pressure, in our research and development activities. Our use of radioactive materials is regulated by the Canadian Nuclear Safety Commission and the U.S. Nuclear Regulatory Commission for the possession, transfer, import, export, use, storage, handling and disposal of radioactive materials. Our use of biological materials and chemicals, including the use, manufacture, storage, handling and disposal of such materials and certain waste products is regulated by a number of federal, state and local laws and regulations. Although we believe that our safety procedures for handling such materials comply with the standards prescribed by such laws and regulations, the risk of accidental contamination or injury from these materials cannot be completely eliminated. In the event of such an accident, we could be held liable for any damages that result and any such liability could exceed our resources. We are not specifically insured with respect to this liability.

Our business, reputation, and operations could suffer in the event of information technology system failures, such as a cybersecurity breach.

We are increasingly dependent on sophisticated software applications and computing infrastructure to conduct critical operations. Disruption, degradation, or manipulation of these applications and systems through intentional or accidental means could impact key business processes. Despite the implementation of security measures, our internal computer systems and those of our contractors and consultants are vulnerable to damage from computer viruses, cybersecurity breaches and other forms of unauthorized access, as well as natural disasters, terrorism, war, and telecommunication and electrical failures. Such events could result in exposure of confidential information, the modification of critical data, and/or the failure or interruption of critical operations. For example, the loss of pre-clinical trial data or data from completed or ongoing clinical trials for our product candidates could result in delays in our regulatory filings and development efforts and significantly increase our costs. To the extent that any disruption or security breach will result in a loss of or damage to our data, or inappropriate disclosure of confidential or proprietary information, we could incur liability and the development of our product candidates could be delayed. While we have implemented security measures, including controls over unauthorized access, our internal computer systems and those of our contractors and consultants are vulnerable to damage from these events. There can be no assurance that our efforts to protect data and systems will prevent service interruption or the loss of critical or sensitive information from our or third party providers' databases or systems that could result in financial, legal, business or reputational harm to us or that our insurance would provide any or adequate coverage of any such loss.

If we fail to maintain an effective system of internal control over financial reporting, we may not be able to accurately report our financial reports, which could have a material adverse effect on our share price and our ability to raise capital.

A failure to maintain effective internal control over financial reporting or disclosure controls and procedures could adversely affect our ability to report our financial results accurately and on a timely basis, which could result in a material misstatement in our financial statements, a loss of investor confidence in our financial reporting or adversely affect our access to sources of liquidity. Furthermore, because of the inherent limitations of any system of internal control over financial reporting, including the possibility of human error, the circumvention or overriding of controls and fraud, even effective internal controls may not prevent or detect all misstatements. Frequent or rapid changes in procedures, methodologies, systems and technology exacerbate the challenge of developing and maintaining a system of internal controls and can increase the cost and level of effort to develop and maintain such systems.

See Item 9A, "Controls and Procedures" in this Form 10-K for additional information and management's assessment of internal controls.

Risks Related to the Ownership of our Common Shares

The concentration of common share ownership with insiders, as well as director nomination rights held by the largest shareholder, will likely limit the ability of the other shareholders to influence corporate matters.

As of March 5, 2019, executive officers, directors, five percent or greater shareholders, and their respective affiliated entities beneficially own, in the aggregate, approximately 56% of our outstanding common shares.

Entities associated with Roivant Sciences Ltd. (“Roivant”) collectively hold as a group approximately 29% of our outstanding common shares as of March 5, 2019. In addition, in October 2017, we issued 500,000 Series A participating convertible preferred shares ("Preferred Shares") to Roivant for gross proceeds of $50.0 million. We issued a second tranche of 664,000 Preferred Shares to Roivant in January 2018 for gross proceeds of $66.4 million. The Preferred Shares are non-voting and are convertible into 22,589,601 common shares at a conversion price of $7.13 per share (which represents a 15% premium to the closing price of $6.20 per share on October 16, 2017). The Preferred Shares are currently not convertible into common

shares. The purchase price for the Preferred Shares plus an amount equal to 8.75% per annum, compounded annually, will be subject to mandatory conversion into common shares on October 18, 2021 (subject to limited exceptions in the event of certain fundamental corporate transactions relating to our capital structure or assets, which would permit earlier conversion at Roivant's option). Assuming the Preferred Shares were converted as of March 5, 2019, Roivant would hold 38,603,141 common shares, or, 49.6% of our outstanding common shares.

As a result, Roivant can significantly influence the outcome of matters requiring shareholder approval, including the election of directors, amendments of our organizational documents, or approval of any merger, sale of assets or other major corporate transaction. This may prevent or discourage unsolicited acquisition proposals or offers for our common shares that you may feel are in your best interest. The interests of Roivant may not always coincide with your interests or the interests of other shareholders and they may act in a manner that advances their best interests and not necessarily those of other shareholders, including seeking a premium value for their common shares. These actions might affect the prevailing market price for our common shares. In addition, Roivant and certain of our other principal shareholders that have held their shares for several years may be more interested in selling our company to an acquiror than other investors, or they may want us to pursue strategies that deviate from the interests of other shareholders. Such concentration of ownership control may also:

- delay, defer or prevent a change in control;
- entrench our management and/or the board of directors; or
- impede a merger, consolidation, takeover or other business combination involving us that other shareholders may desire.

In addition, for so long as Roivant has beneficial ownership or exercises control or direction over not less than (i) 30% of the issued and outstanding common shares, Roivant has the right to nominate three individuals for election to our board of directors, one of whom must be "independent" within the meaning of applicable law and the rules and regulations of The Nasdaq Stock Market LLC, not including the rules related to the independence of audit committee members; (ii) 20% of the issued and outstanding common shares, Roivant has the right to nominate two individuals for election to our board of directors; and (iii) 10% of the issued and outstanding common shares, Roivant has the right to nominate one individual for election to our board of directors. For so long as Roivant has the right to nominate one or more directors to our board of directors, the total number of directors will not, without the prior written consent of Roivant, be permitted to exceed seven directors, the majority of whom must be "independent". While the directors appointed by Roivant are obligated to act in accordance with their fiduciary duty to the Company, they may have equity or other interests in Roivant and, accordingly, their personal interests may be aligned with Roivant's interests, which may not always coincide with our corporate interests or the interests of our other shareholders. The directors are required to disclose any potential material conflicts of interest. The current Roivant nominated directors are Frank Torti, M.D., our Chairman of the Board, Myrtle Potter and Keith Manchester, M.D.

The trading price of the shares of our common shares has been highly volatile, and purchasers of our common shares could incur substantial losses.

The market price of our common shares has and may continue to fluctuate significantly in response to factors, some of which are beyond our control. The stock market in general has recently experienced extreme price and volume fluctuations. The market prices of securities of pharmaceutical and biotechnology companies have been extremely volatile, and have experienced fluctuations that often have been unrelated or disproportionate to the operating performance of these companies. These broad market fluctuations could result in extreme fluctuations in the price of our common shares, which could cause our investors to incur substantial losses. Our share price could be subject to wide fluctuations in response to a variety of factors, which include:

- whether our clinical trials can be conducted within the timeframe that we expect and whether such trials will yield positive results;
- whether our collaborations can be advanced with positive results within the timeframe and budget that we expect;
- changes in laws or regulations applicable to our products or product candidates, including but not limited to clinical trial requirements for approvals;
- unanticipated serious safety concerns related to the use of our product candidates;
- a decision to initiate a clinical trial, not to initiate a clinical trial or to terminate an existing clinical trial;
- adverse regulatory decisions;
- the introduction of new products or technologies offered by us or our competitors;
- the inability to effectively manage our growth;
- actual or anticipated variations in quarterly operating results;
- the failure to meet or exceed the estimates and projections of the investment community;
- the perception of the biopharmaceutical industry by the public, legislatures, regulators and the investment community;
- the overall performance of the U.S. equity capital markets and general political and economic conditions;
- announcements of significant acquisitions, strategic partnerships, joint ventures, collaborations or capital commitments by us or our competitors;
- disputes or other developments relating to proprietary rights, including patents, litigation matters and our ability to obtain patent protection for our technologies;
- additions or departures of key personnel;
- the trading volume of our common shares; and
- other events or factors, many of which are beyond our control.

Our operating results may fluctuate significantly in the future, which may cause our results to fall below the expectations of securities analysts, shareholders and investors.

Our operating results may fluctuate significantly in the future as a result of a variety of factors, many of which are outside of our control. These factors include, but are not limited to:

- the timing, implementation and cost of our research, pre-clinical studies and clinical trials;
- our ability to attract and retain personnel with the necessary strategic, technical and creative skills required for effective operations;
- the amount and timing of expenditures by practitioners and their patients;
- introduction of new technologies;
- product liability litigation, class action and derivative action litigation, or other litigation;
- the amount and timing of capital expenditures and other costs relating to the expansion of our operations;
- the state of the debt and/or equity capital markets at the time of any proposed offering we choose to initiate;
- our ability to successfully integrate new acquisitions into our operations;
- government regulation and legal developments regarding our product candidates in the United States and in the foreign countries in which we may operate in the future; and
- general economic conditions.

As a strategic response to changes in the competitive environment, we may from time to time make pricing, service, technology or marketing decisions or business or technology acquisitions that could have a material adverse effect on our operating results. Due to any of these factors, our operating results may fall below the expectations of securities analysts, shareholders and investors in any future period, which may cause our share price to decline.

We are incorporated in Canada, with our assets and officers located both in Canada and the United States, with the result that it may be difficult for investors to enforce judgments obtained against us or some of our officers.

We are incorporated under the laws of the Province of British Columbia and some of our assets and officers are located outside the United States. While we have appointed National Registered Agents, Inc. as our agent for service of process to effect service of process within the United States upon us, it may not be possible for you to enforce against us or those persons in the United States, judgments obtained in U.S. courts based upon the civil liability provisions of the U.S. federal securities laws or other laws of the United States. In addition, there is doubt as to whether original action could be brought in Canada against us or our directors or officers based solely upon U.S. federal or state securities laws and as to the enforceability in Canadian courts of judgments of U.S. courts obtained in actions based upon the civil liability provisions of U.S. federal or state securities laws.

Conversely, most of our directors and officers reside outside Canada, and with the reorganization around Warminster, PA, the majority of our physical assets will also be located outside Canada. While we have appointed Farris, Vaughan, Wills & Murphy LLP as our agent for service of process in Canada, it may not be possible for you to enforce in Canada against our assets or those directors and officers residing outside Canada, judgments obtained in Canadian courts based upon the civil liability provisions of the Canadian securities laws or other laws of Canada.

If we are deemed to be a "passive foreign investment company" for the current or any future taxable year, investors who are subject to U.S. federal taxation would likely suffer materially adverse U.S. federal income tax consequences.

We generally will be a "passive foreign investment company" under the meaning of Section 1297 of the Code (a "PFIC") if (a) 75% or more of our gross income is "passive income" (generally, dividends, interest, rents, royalties, and gains from the disposition of assets producing passive income) in any taxable year, or (b) if at least 50% or more of the quarterly average value of our assets produce, or are held for the production of, passive income in any taxable year. We have determined that we have not been a PFIC for the three taxable years ended December 31, 2018. If we are a PFIC for any taxable year during which a U.S. person holds our common shares, it would likely result in materially adverse U.S. federal income tax consequences for such U.S. person, including, but not limited to, any gain from the sale of our common shares would be taxed as ordinary income, as opposed to capital gain, and such gain and certain distributions on our common shares would be subject to an interest charge, except in certain circumstances. It may be possible for U.S. persons to fully or partially mitigate such tax consequences by making a "qualifying electing fund election," as defined in the Code (a "QEF Election"), but there is no assurance that we will provide such persons with the information required in order to make a QEF Election.

We may be prohibited from fully using our U.S. net operating loss carryforwards, which could affect our financial performance.

As of December 31, 2018, we had gross net operating loss ("NOL") and research tax credit carryforwards of approximately $11,040,000 and $4,265,000, respectively, for U.S. federal income tax purposes, expiring in varying amounts through the year 2035. Under Section 382 of the Code, if a corporation undergoes an "ownership change," generally defined as a greater than 50% change (by value) in its equity ownership over a three year period, the corporation's ability to use its pre-change NOL carryforwards and other pre-change tax attributes (such as research tax credits) to offset its post-change income may be limited. As of December 31, 2018, we had gross net operating losses of approximately $182,256,000 for Canadian federal income tax purposes, expiring in varying amounts through the year 2038. We also have research tax credit carryforwards of approximately $61,493,000 available for indefinite carryforward. Canadian tax law has similar restrictions as the U.S. Tax Code on a corporation's ability to use its pre-change NOL carryforwards and other pre-change tax attributes. Consequently, our Canadian NOLs could be limited if the organization undergoes an ownership change.

As of December 31, 2018, we have not experienced an ownership change. Therefore, our utilization of NOL carryforwards was not subject to an annual limitation. However, we may experience ownership changes in the future as a result of subsequent shifts in our stock ownership. As a result, if we earn net taxable income, our ability to use our pre-change NOL carryforwards to offset U.S. and Canadian federal taxable income may be subject to limitations, which could potentially result in increased future tax liability to us. In addition, at the state level, there may be periods during which the use of NOL carryforwards is suspended or otherwise limited, which could accelerate or permanently increase state taxes owed. Furthermore, these losses could expire before we generate sufficient income to utilize them.

Future changes to tax laws could materially adversely affect our company and reduce net returns to our shareholders.

The tax treatment of the company is subject to changes in tax laws, regulations and treaties, or the interpretation thereof, tax policy initiatives and reforms under consideration and the practices of tax authorities in jurisdictions in which we operate, as well as tax policy initiatives and reforms related to the Organisation for Economic Co-Operation and Development's, or OECD, Base Erosion and Profit Shifting, or BEPS, Project, the European Commission's state aid investigations and other initiatives. Such changes may include (but are not limited to) the taxation of operating income,

investment income, dividends received or (in the specific context of withholding tax) dividends paid. We are unable to predict what tax reform may be proposed or enacted in the future or what effect such changes would have on our business, but such changes, to the extent they are brought into tax legislation, regulations, policies or practices, could affect our financial position and overall or effective tax rates in the future in countries where we have operations, reduce post-tax returns to our shareholders, and increase the complexity, burden and cost of tax compliance.

Our articles and certain Canadian laws could delay or deter a change of control.

Our preferred shares are available for issuance from time to time at the discretion of our board of directors, without shareholder approval. Our articles allow our board, without shareholder approval, to determine the special rights to be attached to our preferred shares, and such rights may be superior to those of our common shares.

In addition, limitations on the ability to acquire and hold our common shares may be imposed by the Competition Act in Canada. This legislation permits the Commissioner of Competition of Canada to review any acquisition of a significant interest in us. This legislation grants the Commissioner jurisdiction to challenge such an acquisition before the Canadian Competition Tribunal if the Commissioner believes that it would, or would be likely to, result in a substantial lessening or prevention of competition in any market in Canada. The Investment Canada Act subjects an acquisition of control of a company by a non-Canadian to government review if the value of our assets, as calculated pursuant to the legislation, exceeds a threshold amount. A reviewable acquisition may not proceed unless the relevant minister is satisfied that the investment is likely to result in a net benefit to Canada. Any of the foregoing could prevent or delay a change of control and may deprive or limit strategic opportunities for our shareholders to sell their shares.

Future sales of our common shares may depress our share price.

The market price of our common shares could decline as a result of sales of substantial amounts of our common shares in the public market, or as a result of the perception that these sales could occur, which could occur if we issue a large number of common shares (or securities convertible into our common shares) in connection with a future financing, as our common shares are trading at low levels. These factors could make it more difficult for us to raise funds through future offerings of common shares or other equity securities.

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

Although our common shares are listed on the Nasdaq Global Select Market, an active trading market for our common shares may not be sustained, especially given the large percentage of our common shares held by our affiliates. If an active market for our common shares is not sustained, it may be difficult for our shareholders to sell shares without depressing the market price for our common shares.

Additional shares that may be issued upon the exercise of currently outstanding options or upon the conversion of Preferred Shares would dilute the voting power of our currently outstanding common shares and could cause our share price to decline.

As of March 5, 2019, we had outstanding options to acquire approximately 7,944,527 common shares and outstanding Preferred Shares convertible into 22,589,601 common shares on October 18, 2021. The issuance of our common shares upon exercise of the stock options or conversion of the Preferred Shares would result in dilution to the interests of other holders of our common shares and could adversely affect our share price.

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

We have not paid any cash dividends to date and we do not intend to declare dividends for the foreseeable future, as we anticipate that we will reinvest future earnings, if any, in the development and growth of our business. Therefore, investors will not receive any funds unless they sell their common shares, and shareholders may be unable to sell their shares on favorable terms or at all. We cannot assure you of a positive return on investment or that you will not lose the entire amount of your investment in our common shares. Prospective investors seeking or needing dividend income or liquidity should not purchase our common shares.

The value of our securities, including our common shares, might be affected by matters not related to our operating performance and could subject us to securities litigation.

The value of our common shares may be reduced for a number of reasons, many of which are outside our control, including:

- general economic and political conditions in Canada, the United States and globally;
- governmental regulation of the health care and pharmaceutical industries;
- failure to achieve desired drug discovery outcomes by us or our collaborators;
- failure to obtain industry partner and other third party consents and approvals, when required;
- stock market volatility and market valuations;
- competition for, among other things, capital, drug targets and skilled personnel;
- the need to obtain required approvals from regulatory authorities;
- revenue and operating results failing to meet expectations in any particular period;
- investor perception of the health care and pharmaceutical industries;
- limited trading volume of our common shares;
- announcements relating to our business or the businesses of our competitors; and
- our ability or inability to raise additional funds.

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

The trading market for our common shares may be impacted by the availability or lack of research and reports that third-party industry or financial analysts publish about us. There are many large, publicly traded companies active in the biopharmaceutical industry, which may mean it will be less likely that we receive widespread analyst coverage. Furthermore, if one or more of the analysts who do cover us downgrade its shares, its share price would likely decline. If we do not receive adequate coverage by reputable analysts that have an understanding of our business and industry, it could fail to achieve visibility in the market, which in turn could cause our share price to decline.

Item 1B. Unresolved Staff Comments

There are currently no unresolved staff comments.

Item 2. Properties

In June 2014, we signed an agreement effective August 1, 2014 to renew the lease for our Burnaby office and lab facility. The facility has 51,000 square feet of laboratory facilities and office space and is located at 100-8900 Glenlyon Parkway, Burnaby, British Columbia, Canada. In early 2018, we implemented a site consolidation and organizational restructuring to align our HBV business in Warminster, Pennsylvania and we are closing the Burnaby facility upon its lease expiration date of July 31, 2019. We ceased use of our Burnaby facility for R&D activities as of June 30, 2018. We have entered into subleases with various tenants, including Genevant, for a portion of our Burnaby facility. We do not expect the subleasing income to completely cover the costs under the lease to which we remain the primary obligor.

In August 2016, we signed a lease agreement effective November 1, 2016, subsequently amended on October 7, 2016, to enable moving our U.S. operations to 701 Veterans Circle, Warminster, Pennsylvania. The building has approximately 35,000 square feet of laboratory facilities and office space. The lease expires on April 30, 2027. We also have the option of extending the lease for two further five-year terms.

In November 2018, we signed a new lease agreement effective January 1, 2019, for approximately 8,500 square feet of office space at 626 Jacksonville Rd, Warminster, Pennsylvania. The lease has a three year term and we have an option to extend the lease term to April 30, 2027.

We believe that the total space available to us under our current leases will meet our needs for the foreseeable future and that additional space would be available to us on commercially reasonable terms if required.

Item 3. Legal Proceedings

We are involved with various legal matters arising in the ordinary course of business. We make provisions for liabilities when it is both probable that a liability has been incurred and the amount of the loss can be reasonably estimated. Such provisions are reviewed at least quarterly and adjusted to reflect the impact of any settlement negotiations, judicial and administrative rulings, advice of legal counsel, and other information and events pertaining to a particular case. Litigation is inherently unpredictable. Although the ultimate resolution of these various matters cannot be determined at this time, we do not believe that such matters, individually or in the aggregate, will have a material adverse effect on our consolidated results of operations, cash flows, or financial condition.

Acuitas Therapeutics Inc.

On August 29, 2016, we provided Acuitas with notice that we considered Acuitas to be in material breach of their cross-license agreement. The cross-license agreement provides that it may be terminated upon any material breach by the other party 60 days after receipt of written notice of termination describing the material breach in reasonable detail. On October 25, 2016, Acuitas filed a Notice of Civil Claim in the Supreme Court of British Columbia seeking an order that we perform our obligations under the cross license agreement, for damages ancillary to specific performance, injunctive relief, interest and costs. We disputed Acuitas' position and filed a counterclaim seeking, among other relief, a declaration that the cross-license agreement had been terminated.

On January 10, 2017, we filed an application seeking an order to enjoin Acuitas from entering into any further agreements purporting to sublicense our technology from the date of the order to the date of trial or further order from the court. Acuitas filed a response to our application and the matter was the subject of a hearing held on January 26, 2017, which resulted in the Supreme Court of British Columbia granting a pre-trial injunction against Acuitas. Under the terms of the pre-trial injunction, Acuitas was prevented from entering into any new agreements which include sublicensing of our LNP. On March 7, 2017, Acuitas appealed the injunction decision and on April 3, 2017, their appeal was denied. On September 29, 2017, the injunction order was extended by consent to March 2, 2018. On February 21, 2018, the contractual issues concerning the cross-license agreement (excluding the claims for damages) were settled out of court, resulting in the termination of Acuitas' rights to further use or sublicense our LNP technology, making permanent the effect of the Court's prior injunction. The settlement stipulates that the four non-exclusive viral vaccine sublicenses previously granted to Moderna, Inc. ("Moderna") are the only sublicenses to survive. These four sublicenses, previously granted by Acuitas to Moderna under the pre-April 15, 2010 LNP patent families are each limited to a specific viral target. Moderna has no other rights to our broad suite of LNP intellectual property. No other sublicenses of our technology were provided to third parties by Acuitas and accordingly, no other sublicenses of Arbutus technology by Acuitas survived the settlement.

University of British Columbia

Certain early work on LNP delivery systems and related inventions was undertaken by us and assigned to UBC. These inventions were subsequently licensed back to us by UBC under a license agreement, initially entered into in 1998 and subsequently amended in 2001, 2006 and 2007. We have granted sublicenses under the UBC license to Alnylam. Alnylam has in turn sublicensed back to us under the licensed UBC patents for discovery, development and commercialization of siRNA products. Certain sublicenses were also granted to other parties.

On November 10, 2014, UBC filed a notice of arbitration against us and on January 16, 2015, filed a Statement of Claim, which alleges entitlement to $3,500,000 in allegedly unpaid royalties based on publicly available information, and an unspecified amount based on non-public information. UBC also seeks interest and costs, including legal fees. We filed our Statement of Defense to UBC's Statement of Claims, as well as a Counterclaim involving a patent application that we allege UBC wrongly licensed to a third party. The proceedings have been divided into three phases, with the first hearing taking place in June 2017. In the first phase, the arbitrator determined which agreements are sublicense agreements within UBC's claim. Also in the first phase, UBC updated its alleged entitlement from $3,500,000 originally claimed to seek $10,900,000 in alleged unpaid royalties, plus interest arising from payments as early as 2008. No finding was made as to whether any licensing fees are due to UBC under these agreements; this will be the subject of the second phase of arbitration. The second phase of the Arbitration is anticipated to take place in the second quarter of 2019, and the third phase of the arbitration has not yet been scheduled.

Arbitration and related matters are costly and may divert the attention of our management and other resources that would otherwise be engaged in other activities. We continue to dispute UBC's allegations, and are seeking license payments for wrongfully licensed patent application, and an exclusive worldwide license to said application. However, arbitration is subject to inherent uncertainty and an arbitrator could rule against us. We have not recorded an estimate of the possible loss associated with this arbitration, due to the uncertainties related to both the likelihood and amount of any possible loss or range of loss. Costs related to the arbitration are recorded by us as incurred.

Item 4. Mine Safety Disclosures

Not applicable.

PART II

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

Our common shares trade on the Nasdaq Global Select Market under the symbol "ABUS" following our Company name change to Arbutus Biopharma Corporation on July 31, 2015. As at March 5, 2019, there were 102 registered holders of common shares and 56,120,868 common shares issued and outstanding.

Securities Authorized for Issuance under Equity Compensation Plans

Information regarding securities authorized for issuance under equity compensation plans is incorporated by reference into the information in Part III, Item 12 of this Form 10-K.

Recent Sales of Unregistered Securities

We did not issue any unregistered equity securities during the quarter ended December 31, 2018.

Purchases of Equity Securities by the Issuer and Affiliated Purchasers

We did not repurchase any of our equity securities during the year ended December 31, 2018.

Item 6. Selected Financial Data

We are a smaller reporting company as defined by Rule 12b-2 of the Securities Exchange Act of 1934 and are not required to provide the information under this item.

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

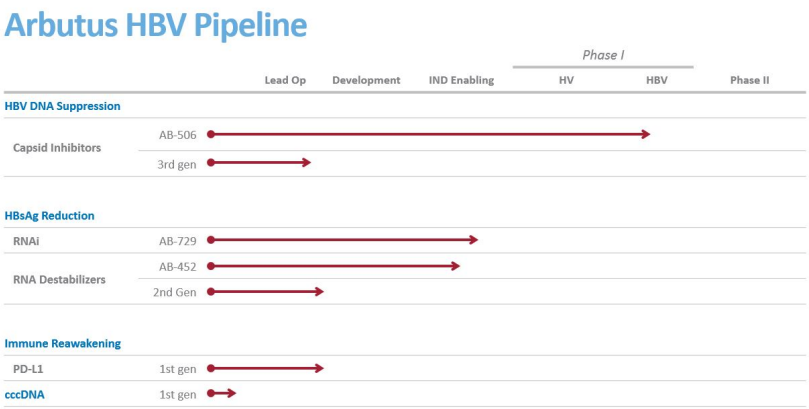
Overview

We are an industry-leading therapeutic solutions company dedicated to discovering, developing, and commercializing a cure for patients suffering from chronic HBV infection. HBV represents a significant, global unmet medical need. The World Health Organization estimates that 257 million people worldwide suffer from HBV infection, while other estimates suggest that approximately 2 million people in the United States have HBV.

To pursue our strategy of developing a curative combination regimen for chronic HBV, we have assembled a robust pipeline consisting of multiple drug candidates with complementary MOA, each of which has the potential to improve upon the SOC and contribute to a curative combination treatment regimen. Our pipeline includes agents that have the potential to form an effective proprietary combination therapy.

Our product pipeline is entirely focused on finding a cure for chronic HBV infection, with the objective of developing a suite of products that intervene at different points in the viral life cycle and reactivate the host immune system. We are currently conducting one clinical trial and several pre-clinical combination studies to evaluate combinations of proprietary HBV therapeutic agents in addition to standard of care therapies to support their clinical use in combination. We expect to use the results from these studies to adaptively design additional clinical trials to test the efficacy of the combination therapy and the duration of the result in patients. We plan to identify a combination regimen to conduct Phase III clinical trials intended to ultimately support regulatory filings for marketing approval.

Our HBV product pipeline consists of the following programs:



In addition to our drug pipeline focused on HBV, we have additional assets that have the potential to provide value to our Company. The first is our approximate 40% equity ownership interest in Genevant, a newly created company to which we have licensed our Delivery Platforms for all applications except HBV. Secondly, we retain a royalty entitlement on Onpattro™ (Patisiran), a drug developed by Alnylam that incorporates our LNP technology and was approved by the FDA and EMA during the third quarter of 2018. This royalty entitlement has the potential to provide an active royalty stream or to be otherwise monetized in full or in part. These additional assets have the potential to provide significant non-dilutive capital to fund development of our HBV pipeline.

CRITICAL ACCOUNTING POLICIES AND ESTIMATES

The significant accounting policies that we believe to be most critical in fully understanding and evaluating our financial results are revenue recognition, stock-based compensation, and goodwill and intangible asset impairment. These accounting policies require us to make certain estimates and assumptions. We believe that the estimates and assumptions upon which we rely are reasonable, based upon information available to us at the time that these estimates and assumptions are made. Actual results may differ from our estimates. Our critical accounting estimates affect our net income or loss calculation.

Revenue Recognition / ASC 606, *Revenue From Contracts with Customers* ("ASC 606") became effective for us on January 1, 2018, and was adopted using the modified retrospective method under which previously presented financial statements are not restated and the cumulative effect of adopting ASC 606 on contracts in process is recognized by an adjustment to retained earnings at the effective date. The adoption of ASC 606 did not change our recognized revenue under our ongoing significant collaboration and license agreements and no cumulative effect adjustment was required.

ASC 606 requires an entity to recognize the amount of revenue to which it expects to be entitled for the transfer of promised goods or services to customers under a five-step model: (i) identify contract(s) with a customer; (ii) identify the performance obligations in the contract; (iii) determine the transaction price; (iv) allocate the transaction price to the performance obligations in the contract; and (v) recognize revenue when or as a performance obligation is satisfied.

We generate revenue primarily through collaboration agreements and license agreements. Such agreements may require us to deliver various rights and/or services, including intellectual property rights or licenses and research and development services. Under such agreements, we are generally eligible to receive non-refundable upfront payments, funding for research and development services, milestone payments, and royalties.

In contracts where we have more than one performance obligation to provide our customer with goods or services, each performance obligation is evaluated to determine whether it is distinct based on whether (i) the customer can benefit from the good or service either on its own or together with other resources that are readily available and (ii) the good or service is separately identifiable from other promises in the contract. The consideration under the contract is then allocated between the distinct performance obligations based on their respective relative stand-alone selling prices. The estimated stand-alone selling price of each deliverable reflects our best estimate of what the selling price would be if the deliverable was regularly sold on a stand-alone basis and is determined by reference to market rates for the good or service when sold to others or by using an adjusted market assessment approach if the selling price on a stand-alone basis is not available.

The consideration allocated to each distinct performance obligation is recognized as revenue when control is transferred to the customer for the related goods or services. Consideration associated with at-risk substantive performance milestones, including sales-based milestones, is recognized as revenue when it is probable that a significant reversal of the cumulative revenue recognized will not occur. Sales-based royalties received in connection with licenses of intellectual property are subject to a specific exception in the revenue standards, whereby the consideration is not included in the transaction price and recognized in revenue until the customer’s subsequent sales or usages occur.

Stock-based compensation / The stock-based compensation that we record is a critical accounting estimate due to the value of compensation recorded, the volume of our stock option activity, and the many assumptions that are required to be made to calculate the compensation expense.

Compensation expense is recorded for stock options issued to employees and directors using the fair value method. We must calculate the fair value of stock options issued and amortize the fair value to stock compensation expense over the vesting period, and adjust the expense for stock option forfeitures and cancellations. We use the Black-Scholes model to calculate the fair value of stock options issued which requires that certain estimates, including the expected life of the option and expected volatility of the stock, be made at the time that the options are issued. This accounting estimate is reasonably likely to change from period to period as further stock options are issued and adjustments are made for stock option forfeitures and cancellations. Our accounting policy is to recognize forfeitures as they occur. The term "forfeitures" is distinct from "cancellations" or "expirations" and represents only the unvested portion of the surrendered stock option. For the purpose of calculating fair value, the expected life of stock options granted is five years for employees and eight years for directors and executives. We amortize the fair value of stock options using the straight-line method over the vesting period of the options, generally a period of three years for employees and immediate vesting for directors.

We recorded stock-based compensation expense for our equity-classified awards in 2018 of $6.0 million (as compared to $15.1 million in 2017). Stock-based compensation expense for 2017 includes $8.0 million of compensation expense related to the expiration of repurchase rights on certain shares held by the founders of Arbutus Inc. - refer to Note 2 to our consolidated financial statements.

Goodwill and intangible assets - Impairment / Intangible assets classified as indefinite-lived and goodwill are not amortized, but are evaluated for impairment annually using a measurement date of December 31. In addition, if there is a major event indicating that the carrying value of an asset may not be recoverable, then management will perform an impairment test in an interim period by comparing the discounted cash flow values to each asset's carrying value to determine if a write down is necessary. Such indicators include, but are not limited to, on an ongoing basis: (a) industry and market considerations such as an increased competitive environment or an adverse change in legal factors including an adverse assessment by regulators; (b) an accumulation of costs significantly in excess of the amount originally expected for the development of the asset; (c) current period operating or cash flow loss combined with a history of operating or cash flow losses or a projection or forecast that demonstrates continuing losses associated with the use of the asset; (d) adverse research and development program results; and (e) if applicable, a sustained decrease in share price.

In assessing impairment, significant judgments are required to be made by management to estimate the timing and extent of future net cash flows, appropriate discount rates, probability of program success and other estimates and assumptions that could materially affect the determination of fair value. These judgments include the use of, but are not limited to: projected results of operations and forecast cash flows based on our corporate budgets as approved by our board of directors, third party forecasts and data and other macroeconomic indicators that forecasts market conditions and our estimated future revenues and growth, market-based discount rates and other market-comparative data. As assumptions related to the probability of program success and timing and amount of potential future cash flows related to these programs is highly uncertain due to the unpredictable nature of each phase of these programs, management risk adjusts the estimated cash flows to reflect these uncertainties.

During the year ended December 31, 2018, we recorded a net impairment charge to our intangible assets of $10.5 million (impairment charge of $14.8 million less a corresponding income tax benefit of $4.3 million) related to the indefinite deferral of further development of our AB-423 program in the capsid inhibitor drug class as a result of our decision to advance our second generation capsid inhibitor (AB-506) into the HBV patient portion of our phase 1 clinical trial.

During the year ended December 31, 2017, we recorded a total net impairment charge of $23.9 million (impairment charge of $40.8 million less a corresponding income tax benefit of $16.9 million) against our identified intangible assets for the discontinuance of STING agonists, which represented the entire remaining acquired Immune Modulator drug class.

We perform our annual impairment analysis at December 31st each year. Effective October 1, 2017, we early adopted Accounting Standards Update 2017-04 – *Intangibles – Goodwill and Other (Topic 350): Simplifying the Test for Goodwill Impairment.* ASU 2017-04 and eliminated Step 2 from the goodwill impairment test, which required a hypothetical purchase price allocation, and permits a qualitative assessment to determine if a quantitative assessment (Step 1) is required. At December 31, 2018 and 2017, we performed a qualitative assessment using factors including but not limited to: (a) macroeconomic conditions; (b) industry and market considerations; (c) cost factors; (d) overall financial performance; (e) other relevant entity-specific events; (f) events affecting a reporting unit; and (g) if applicable, a sustained decrease in share price in absolute terms and relative to peers. Based on our qualitative assessment, we concluded that as at December 31, 2018 and 2017, it was not more likely than not that the fair value of our single reporting unit was less than its carrying amount; therefore, a quantitative assessment was not necessary.

Fair value determinations require considerable judgment and are sensitive to changes in underlying assumptions and factors, and any key assumptions in the cash flow projections are interdependent on each other. A change in any one or combination of these assumptions could impact the estimated fair value of the reporting unit. Although we believe our assumptions are reasonable, the significant level of judgment needed to determine our assumptions, the uncertainty inherent in these assumptions and the extended time frame over which we are required to make our estimates, increases the risk that actual results will vary significantly. Given the dependency of our cash flow models on the successful development, production and sale of products from our existing programs, if any significant programs are unsuccessful then, excluding other possible changes in our forecasts, our estimated future cash flows will be reduced and such reduction may be significant enough to result in an impairment of the carrying value of our intangible assets. The outcome of our programs are subject to a variety of risks, including but not limited to, technological risk associated with in-process research and development ("IPR&D") assets, dependency on regulatory approval and competitive, legal and other regulatory forces. See the "Risk Factors" in this annual report on Form 10-K for additional risk factors.

Contingent Consideration / In connection with the acquisition of Enantigen in October 2014, we have obligations to make potential future payments to the former shareholders of Enantigen contingent upon the achievement of certain development milestones (up to $21.0 million) and commercial milestones (up to $102.5 million). The development milestones are tied to programs which are no longer under development by us. The sales milestones are tied to the first commercial sales by us of a product indicated for the treatment of HBV. These potential contingent payments are recorded as a liability and remeasured to fair value each reporting date. In assessing the fair value of the liability, significant judgments are required to be made by management to estimate the probability of program success, the achievement of development milestones, the timing and extent of future product sales, appropriate discount rates, and other estimates and assumptions that could materially affect the determination of fair value. These judgments include the use of, but are not limited to: future forecasts and other macroeconomic indicators that forecast market conditions, the timing and amount of estimated future revenues, market-based discount rates and other market-comparative data. As assumptions related to the probability of program success and timing and amount of potential future product sales are highly uncertain due to the unpredictable nature of product development, management risk adjusts the estimated cash flows to reflect these uncertainties.

RESULTS OF OPERATIONS

The following summarizes the results of our operations for the 2018 and 2017 fiscal years, in millions:

		2018		2017
Total revenue	**$**	**5.9**	$	10.7
Operating expenses		**95.7**		121.6
Loss from operations		**(89.8)**		(110.9)
Net loss		**(57.1)**		(84.4)
Net loss attributable to common shares		**(67.2)**		(85.3)

Year ended December 31, 2018 compared to the year ended December 31, 2017

For the fiscal year ended December 31, 2018, our net loss was $(57.1) million, or $(1.21) basic and diluted loss per common share, as compared to a net loss of $(84.4) million, or $(1.56) basic and diluted loss per common share for the year ended December 31, 2017.

Revenue / Revenue is summarized in the following table, in millions:

		2018	% of Total		2017	% of Total
Collaborations and contracts						
Alexion	**$**	**—**	**—%**	$	8.0	75%
Gritstone		**4.3**	**73%**		2.5	23%
Other milestone and royalty payments		**1.6**	**27%**		0.2	2%
Total revenue	**$**	**5.9**		$	10.7	

Revenue contracts are described in more detail in "Item 1. Business".

Alexion revenue

In March 2017, we signed a License Agreement with Alexion that granted Alexion exclusive use of our proprietary LNP technology in one of its rare disease programs, and began recognizing a portion of the non-refundable upfront payment and services provided. In July 2017, we received notice of termination from Alexion for the license agreement. The termination was driven by a strategic review of Alexion's business and research and development portfolio, which included a decision to discontinue development of mRNA therapeutics.

Gritstone revenue

In October 2017, we entered into a license agreement with Gritstone that entitles Gritstone to research, develop, manufacture and commercialize products with our LNP technology. We received an upfront license payment, and are eligible to receive further potential payments for development and commercial milestone and royalty payments on future product sales. Revenue recognized during 2018 and 2017 relates to the earned portion of the upfront license fee, as well as services provided to Gritstone. In April 2018, together with Roivant, we launched Genevant, a company focused on the discovery, development and commercialization of a broad range of RNA-based therapeutics. In connection with that transaction, we licensed exclusive rights to our LNP technology to Genevant for RNA-based applications outside HBV. As a result of our agreement with Genevant, from April 11, 2018 onwards, Genevant is entitled to 50% of the revenues earned (excluding the upfront license payment discussed above) by us from Gritstone. In 2018, Gritstone paid a development milestone of $2.5 million pursuant to the license agreement, half of which went to us and half of which went to Genevant. We record service revenues from Gritstone net of charges by Genevant for services provided to Gritstone.

Other milestone and royalty payments

During the third quarter of 2018, Alnylam's Onpattro™, which utilizes our LNP technology, was approved by the FDA and the EMA. In 2018, we recorded revenue of $750,000 for development milestones related to FDA approval and the first commercial sale of Onpattro™. Additionally, we retain full rights to low to mid single-digit royalties on global sales of

Onpattro™. We received the first royalty payment for sales of Onpattro™ from Alnylam in the fourth quarter of 2018. We also continue to earn royalties from Spectrum on the sales of Marqibo, which uses a license to our technology, and licensing fee revenue from Acuitas under a licensing and collaboration arrangement. Additionally, in 2018, we received a final close-out payment under an agreement with the DoD related to the development of TKM-Ebola that was terminated in 2015.

Expenses / Expenses are summarized in the following table, in millions:

	2018	**% of Total**	2017	% of Total
Research and development	**$ 57.9**	**61%**	$ 62.7	52%
General and administrative	**16.0**	**17%**	16.1	13%
Depreciation	**2.2**	**2%**	2.0	2%
Site consolidation	**4.8**	**5%**	—	—%
Impairment of intangible assets	**14.8**	**15%**	40.8	34%
Total operating expenses	**$ 95.7**		$ 121.6	

Research and development

Research and development expenses consist primarily of clinical and pre-clinical trial expenses, personnel expenses, consulting and third party expenses, consumables and materials, as well as a portion of stock-based compensation and general overhead costs.

Research and development expenses decreased by $4.7 million in 2018 as compared to 2017, primarily due to a $6.6 million decrease in non-cash stock based compensation expense due to the expiry of certain share repurchase rights in 2017. Research and development expenses in 2018, excluding stock based compensation, increased $1.9 million as compared to 2017. During 2018, we conducted pre-clinical and clinical activities to advance our HBV product pipeline, including completion of the healthy volunteer portion of a Phase 1a/1b clinical trial for our lead capsid inhibitor, AB-506, and initiation of the 28-day HBV patient portion of the trial in the fourth quarter of 2018. In addition, we further developed and conducted IND/CTA enabling pre-clinical studies for AB-729 (capsid inhibitor) and AB-452 (HBV RNA Destabilizer), incurred costs related to our clinical trial of ARB-1467, development of which has subsequently been discontinued, and incurred additional research costs related to our discovery and pre-clinical programs.

A significant portion of our research and development expenses are not tracked by project as they benefit multiple projects or our technology platform and because our most-advanced programs are not yet in late-stage clinical development. However, our collaboration agreements contain cost-sharing arrangements pursuant to which certain costs incurred under the project are reimbursed. Costs reimbursed under collaborations typically include certain direct external costs and hourly or full-time equivalent labor rates for the actual time worked on the project. As a result, although a significant portion of our research and development expenses are not tracked on a project-by-project basis, we do, however, track direct external costs attributable to, and the actual time our employees worked on our collaborations.

General and administrative

General and administrative expenses decreased $0.1 million in 2018 compared to 2017 primarily due to a $2.5 million decrease in non-cash stock based compensation expense resulting from the expiry of certain share repurchase rights in 2017. General and administrative expenses in 2018, excluding stock based compensation, increased $2.4 million compared to 2017 primarily due to an increase in professional fees, including legal and valuation services related to the formation of Genevant.

Site consolidation charges

In February 2018, we announced a site consolidation and organizational restructuring to better align our HBV business in Warminster, PA, by reducing our global workforce and closing our Burnaby, Canada facility. Most of the employee-related site consolidation expenses were expensed ratably over the period that employees provided services, which was substantially complete by June 30, 2018. We have accrued the cost of remaining lease payments for the Burnaby facility through its expiration date of July 31, 2019, offset by income that we expect to receive under sublease agreements. We expect total site consolidation expenses to be approximately $5.6 million, of which approximately $4.8 million has been incurred as of December 31, 2018.

Impairment of intangible assets and goodwill

During 2018, we recorded an impairment charge of $14.8 million and a corresponding income tax benefit of $4.3 million related to identified intangible assets associated with our AB-423 program. During 2018, we decided to indefinitely delay further development of our AB-423 program due to the successful progression of our AB-506 program.

During 2017, we recorded a total impairment charge of $40.8 million and a corresponding income tax benefit of $16.9 million related to identified intangible assets associated with our acquired Immune Modulators drug class. During 2017, we decided to discontinue our STING agonist program that utilized those intangible assets.

On December 31, we performed our annual impairment analysis for intangible assets and goodwill. Other than the impairment charge for intangible assets associate with our AB-423 program described above, no other impairment charges related to intangible assets or goodwill were recorded during 2018.

Other income (losses) / Other income (losses) are summarized in the following table, in millions:

		2018		2017
Interest income	**$**	**3.0**	$	1.5
Interest expense		**(0.2)**		(0.3)
Gain on investment		**24.9**		—
Equity investment loss		**(5.6)**		—
Decrease (increase) in fair value of contingent consideration		**7.3**		(1.4)
Foreign exchange gains (losses)		**(1.0)**		2.3
Total other income (losses)	**$**	**28.4**	$	2.1

Interest income

Interest income increased $1.5 million in 2018 compared to 2017 primarily due to a higher average balance of cash, cash equivalents and investments and higher interest rates.

Gain on investment and equity investment loss

In 2018, together with Roivant, we launched Genevant, a company focused on the discovery, development, and commercialization of a broad range of RNA-based therapeutics enabled by our LNP Delivery Technologies. This transaction, together with a subsequent secondary financing of Genevant, resulted in a gain on investment of $24.9 million. We account for our 40% ownership interest in Genevant using the equity method of accounting. In 2018, we recorded $5.6 million, our proportionate share of Genevant's net loss on a one-quarter lag basis, under the caption "Equity investment (loss)" in our condensed consolidated statement of operations.

Decrease (increase) in fair value of contingent consideration

Contingent consideration is a liability we assumed from our acquisition of Arbutus, Inc. in March 2015. In general, increases in the fair value of the contingent consideration are related to the progress of our programs as they get closer to triggering contingent payments. The $7.3 million decrease in contingent consideration in 2018 was primarily due to our decision in 2018 to indefinitely delay further clinical development of AB-423, thereby reducing the probability of achieving future development milestones, as well as a recalibration of the estimated timing of future sales milestones being achieved, resulting in a reduction in the estimated fair value of the liability.

Foreign exchange gains (losses)

During the year, we continued to incur expenses and hold cash and investment balances in Canadian dollars, and as such, remained subject to risks associated with foreign currency fluctuations. For the year ended December 31, 2018, we recorded a foreign exchange loss of $1.0 million, which is primarily due to the impact of the strengthening U.S. dollar during 2018 on our Canadian denominated cash balances and accounts payable.

Income tax benefit

For the year ended December 31, 2018, we recorded an income tax benefit of $4.3 million due to a decrease in our deferred tax liabilities resulting from an impairment charge to intangible assets.

For the year ended December 31, 2017, we recorded an income tax benefit of $24.3 million due to a $16.9 million decrease in our deferred tax liability related to an impairment of intangible assets and $7.4 million from the reduction in federal tax rates from the U.S. tax reform on our remaining intangible assets.

LIQUIDITY AND CAPITAL RESOURCES

Since our incorporation, we have financed our operations primarily through the sale of equity securities, issuance of debt, revenues from collaborations and licenses, and government grants.

At December 31, 2018, we had cash and cash equivalents of $36.9 million and short-term investments of $87.7 million, totaling $124.6 million. We had no outstanding debt at December 31, 2018.

In December 2018, we entered into an Open Market Sale Agreement (the “Sale Agreement”) with Jefferies LLC, under which we may issue and sell common shares, from time to time, for an aggregate sales price of up to $50.0 million. We had not sold any shares under the Sale Agreement as of December 31, 2018.

We have two potential sources of significant non-dilutive capital to help fund development of our HBV pipeline. The first is our approximate 40% equity ownership interest in Genevant, a recently created company to which we have licensed our LNP platform and conjugate delivery platform for all applications except HBV. Secondly, we retain a royalty entitlement on Onpattro™ (Patisiran), a drug developed by Alnylam that incorporates our LNP technology and was approved by the FDA and EMA during the third quarter of 2018. This royalty entitlement has the potential to provide an active royalty stream or to be otherwise monetized in full or in part.

In October 2017, we closed the sale of 500,000 Series A participating convertible preferred shares ("Preferred Shares") to Roivant for gross proceeds of $50.0 million. A second tranche of 664,000 Preferred Shares for gross proceeds of $66.4 million closed in January 2018, following receipt of the approval of our shareholders. We are using these proceeds to develop and advance product candidates through clinical trials, as well as for working capital and general corporate purposes.

Cash requirements

At December 31, 2018 we held an aggregate of $124.6 million in cash, cash equivalents and short-term investments. We believe we have sufficient cash resources to fund our operations for at least the next 12 months. In the future, substantial additional funds will be required to continue with the active development of our pipeline products and technologies. In particular, our funding needs may vary depending on a number of factors including:

- the need for additional capital to fund future business development programs;
- revenue earned from our legacy collaborative partnerships and licensing agreements, including potential royalty payments from Alnylam's Onpattro;
- revenue earned from ongoing collaborative partnerships, including milestone and royalty payments;
- the extent to which we continue the development of our product candidates, add new product candidates to our pipeline, or form collaborative relationships to advance our products;
- delays in the development of our products due to pre-clinical and clinical findings;
- our decisions to in-license or acquire additional products or technology for development, in particular for our HBV therapeutics programs;
- our ability to attract and retain corporate partners, and their effectiveness in carrying out the development and ultimate commercialization of our product candidates;
- whether batches of drugs that we manufacture fail to meet specifications resulting in delays and investigational and remanufacturing costs;
- the decisions, and the timing of decisions, made by health regulatory agencies regarding our technology and products;
- competing technological and market developments; and
- costs associated with prosecuting and enforcing our patent claims and other intellectual property rights, including litigation and arbitration arising in the course of our business activities.

We intend to seek funding to maintain and advance our business from a variety of sources including public or private equity or debt financing, collaborative arrangements with pharmaceutical companies and government grants and contracts. There can be no assurance that funding will be available at all or on acceptable terms to permit further development of our products.

If adequate funding is not available, we may be required to delay, reduce or eliminate one or more of our research or development programs or reduce expenses associated with our non-core activities. We may need to obtain funds through arrangements with collaborators or others that may require us to relinquish most or all of our rights to product candidates at an earlier stage of development or on less favorable terms than we would otherwise seek if we were better funded. Insufficient financing may also mean failing to prosecute our patents or relinquishing rights to some of our technologies that we would otherwise develop or commercialize.

Cash Flows

The following table summarizes our cash flow activities for the periods indicated, in millions:

	Year ended December 31	
	2018	2017
Net loss for the year	**$ (57.1)**	**$ (84.4)**
Adjustments to reconcile net loss to net cash used in operating activities	**(6.5)**	**32.7**
Changes in operating assets and liabilities	**(4.3)**	**3.1**
Net cash used in operating activities	**(67.9)**	**(48.6)**
Net cash provided by (used in) investing activities	**(4.1)**	**27.8**
Net cash provided by financing activities	**55.6**	**49.3**
Effect of foreign exchange rate changes on cash & cash equivalents	**(1.0)**	**2.4**
Net increase (decrease) in cash, cash equivalents and restricted cash	**(17.4)**	**30.9**
Cash, cash equivalents and restricted cash, beginning of year	**54.3**	**23.4**
Cash, cash equivalents and restricted cash, end of year	**$ 36.9**	**$ 54.3**

Cash used in operating activities in 2018 increased $19.3 million compared to 2017 primarily due to an increase in development spending in 2018, site consolidation costs in 2018, and a decrease in cash inflows from the collaboration agreements (primarily due to $7.5 million received from Alexion in 2017).

Cash provided by (used in) investing activities in 2018 decreased $19.3 million compared to 2017 primarily due to net acquisitions of short-term investments with proceeds from the preferred share financing.

Cash provided by financing activities in 2018 increased $6.3 million compared to 2017. Cash provided by financing activities in 2018 primarily consisted of $66.4 million of net proceeds received in January 2018 from the second tranche of the preferred share financing, partially offset by repayment of a $12.0 million promissory note. Cash provided by financing activities in 2017 primarily consisted of $48.9 million of net proceeds received in October 2017 from the first tranche of the preferred share financing.

OFF-BALANCE SHEET ARRANGEMENTS

We do not have any off-balance sheet arrangements that have or are reasonably likely to have a current or future effect on our financial condition, changes in financial condition, revenues or expenses, results of operations, liquidity, capital expenditures or capital resources that are material to investors.

RECENT ACCOUNTING PRONOUNCEMENTS

From time to time, new accounting pronouncements are issued by the Financial Accounting Standards Board or other standard setting bodies that we adopt as of the specified effective date. Unless otherwise discussed, we believe that the impact of recently issued standards that are not yet effective will not have a material impact on our financial position or results of operations upon adoption.

Please refer to Note 2 to our consolidated financial statements included in Part II, Item 8, "Financial Statements and Supplementary Data," of this annual report on Form 10-K for a description of recent accounting pronouncements applicable to our business.

Item 7A. Quantitative and Qualitative Disclosures about Market Risk

Not applicable.

Item 8. Financial Statements and Supplementary Data

INDEX TO CONSOLIDATED FINANCIAL STATEMENTS

Report Of Independent Registered Public Accounting Firm

To the Stockholders and Board of Directors of Arbutus Biopharma Corporation

Opinion on the Consolidated Financial Statements

We have audited the accompanying consolidated balance sheets of Arbutus Biopharma Corporation (the Company) as of December 31, 2018 and 2017, the related consolidated statements of operations and comprehensive loss, stockholders' equity and cash flows for each of the years in the two-year period ended December 31, 2018, and the related notes (collectively, the consolidated financial statements). In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of the Company as of December 31, 2018 and 2017, and the results of its operations and its cash flows for each of the years in the two-year period ended December 31, 2018, in conformity with U.S. generally accepted accounting principles.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the Company's internal control over financial reporting as of December 31, 2018, based on criteria established in Internal Control - Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission, and our report dated March 7, 2019 expressed an unqualified opinion on the effectiveness of the Company's internal control over financial reporting.

Change in Accounting Principle

As discussed in Note 2 to the consolidated financial statements, the Company has changed its accounting policies for revenue recognition as of January 1, 2018 due to the adoption of ASC 606 - Revenue from Contracts with Customers.

Basis for Opinion

These consolidated financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on these consolidated financial statements based on our audits. We are a public accounting firm registered with the 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 consolidated financial statements are free of material misstatement, whether due to error or fraud. Our audits included performing procedures to assess the risks of material misstatement of the consolidated financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the consolidated financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. We believe that our audits provide a reasonable basis for our opinion.

/s/ KPMG
Chartered Professional Accountants

We have served as the Company's auditor since 2002.

Vancouver, Canada

March 7, 2019

Report Of Independent Registered Public Accounting Firm

To the Stockholders and Board of Directors of Arbutus Biopharma Corporation

Opinion on Internal Control Over Financial Reporting

We have audited Arbutus Biopharma Corporation's (the Company) internal control over financial reporting as of December 31, 2018, based on criteria established in Internal Control - Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission. In our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of December 31, 2018, based on criteria established in Internal Control - Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the consolidated balance sheets of the Company as of December 31, 2018 and 2017, the related consolidated statements of operations and comprehensive loss, stockholders' equity, and cash flows for each of the years in the two-year period ended December 31, 2018, and the related notes (collectively, the consolidated financial statements), and our report dated March 7, 2019, expressed an unqualified opinion on those consolidated financial statements.

Basis for Opinion

The Company's management is responsible for maintaining effective internal control over financial reporting and for its assessment of the effectiveness of internal control over financial reporting, included in the accompanying Management's Annual Report on Internal Control over Financial Reporting. Our responsibility is to express an opinion on the Company's internal control over financial reporting based on our audit. We are a public accounting firm registered with the 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 audit in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether effective internal control over financial reporting was maintained in all material respects. Our audit of internal control over financial reporting included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, and testing and evaluating the design and operating effectiveness of internal control based on the assessed risk. Our audit also included performing such other procedures as we considered necessary in the circumstances. We believe that our audit provides a reasonable basis for our opinion.

Definition and Limitations of Internal Control Over Financial Reporting

A company's internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company's internal control over financial reporting includes those policies and procedures that (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (2) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (3) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.

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

/s/ KPMG
Chartered Professional Accountants

Vancouver, Canada
March 7, 2019

ARBUTUS BIOPHARMA CORPORATION

Consolidated Balance Sheets

(Expressed in thousands of US Dollars, except share and per share amounts)

(Prepared in accordance with US GAAP)

	December 31, 2018	December 31, 2017
Assets		
Current assets:		
Cash and cash equivalents	**$ 36,942**	$ 54,292
Short-term investments	**87,675**	72,060
Accounts receivable	**1,431**	402
Accrued revenue	**—**	128
Investment tax credits receivable	**389**	340
Prepaid expenses and other assets	**2,792**	2,144
Total current assets	**129,229**	129,366
Restricted investment (note 9)	**—**	12,601
Investment in Genevant (note 4)	**22,224**	—
Property and equipment, (at cost, net of accumulated depreciation ($6,896) (2017 - ($12,671)) (note 5)	**10,145**	12,183
Intangible assets (note 6)	**43,836**	58,647
Goodwill (note 6)	**22,471**	24,364
Total assets	**$ 227,905**	$ 237,161
Liabilities and stockholders' equity		
Current liabilities:		
Accounts payable and accrued liabilities (note 7)	**$ 9,429**	$ 10,646
Deferred revenue (note 11)	**—**	2,742
Site consolidation accrual (note 8)	**1,331**	—
Liability-classified options (notes 2 and 12)	**479**	1,239
Total current liabilities	**11,239**	14,627
Deferred rent and inducements, long term	**645**	693
Loan payable (notes 2 and 9)	**—**	12,001
Contingent consideration (note 15)	**3,126**	10,424
Deferred tax liability (note 13)	**12,661**	16,943
Total liabilities	**27,671**	54,688
Stockholders' equity:		
Preferred shares (note 10)		
Authorized - 1,164,000 with no par value		
Issued and outstanding: 1,164,000 (December 31, 2017 - 500,000)	**126,136**	49,780
Common shares (note 10)		
Authorized - unlimited number with no par value		
Issued and outstanding: 55,518,800 (December 31, 2017 - 55,060,650)	**879,405**	876,108
Additional paid-in capital	**48,084**	42,840
Deficit	**(805,221)**	(738,070)
Accumulated other comprehensive loss	**(48,170)**	(48,185)
Total stockholders' equity	**200,234**	182,473
Total liabilities and stockholders' equity	**$ 227,905**	$ 237,161

Nature of business and future operations (note 1), Contingencies and commitments (note 15)

See accompanying notes to the consolidated financial statements.

ARBUTUS BIOPHARMA CORPORATION

Consolidated Statements of Operations and Comprehensive Loss
(Expressed in thousands of US Dollars, except share and per share amounts)
(Prepared in accordance with US GAAP)

	Year ended December 31,	
	2018	2017
Revenue (note 11)	**5,945**	10,700
Expenses		
Research and development	**57,934**	62,676
General and administrative	**16,002**	16,129
Depreciation of property and equipment	**2,181**	2,027
Site consolidation (note 8)	**4,797**	—
Impairment of intangible assets (note 6)	**14,811**	40,798
Total expenses	**95,725**	121,630
Loss from operations	**(89,780)**	(110,930)
Other income (loss)		
Interest income	**3,047**	1,538
Interest expense	**(226)**	(261)
Gain on investment (note 4)	**24,884**	—
Equity investment (loss) (note 4)	**(5,562)**	—
Foreign exchange gains/(loss)	**(1,003)**	2,301
Decrease (increase) in fair value of warrant liability (note 3)	**—**	(22)
Decrease (increase) in fair value of contingent consideration (note 3)	**7,298**	(1,359)
Total other income	**$ 28,438**	$ 2,197
Loss before income taxes	**(61,342)**	(108,733)
Deferred income tax recovery (notes 13)	**4,282**	24,320
Net loss	**$ (57,060)**	$ (84,413)
Items applicable to preferred shares		
Accrual of coupon on convertible preferred shares (note 10)	**(10,091)**	(911)
Net loss attributable to common shares	**$ (67,151)**	$ (85,324)
Net loss attributable to common shareholders, per share		
Basic	**$ (1.21)**	$ (1.56)
Diluted	**$ (1.21)**	$ (1.56)
Weighted average number of common shares		
Basic	**55,304,083**	54,723,272
Diluted	**55,304,083**	54,723,272
Other Comprehensive loss		
Cumulative translation adjustment	**15**	—
Comprehensive loss	**$ (57,045)**	$ (84,413)

See accompanying notes to the consolidated financial statements.

ARBUTUS BIOPHARMA CORPORATION

Consolidated Statement of Stockholders' Equity

(Expressed in thousands of US Dollars, except share and per share amounts)

(Prepared in accordance with US GAAP)

	Convertible Preferred Shares		Common Shares					
	Number of Shares	Amount	Number of shares	Amount	Additional paid-in capital	Deficit	Accum-ulated other compre-hensive loss	Total stockholders' equity
Balance at December 31, 2016	—	—	54,841,494	867,393	36,543	(652,746)	(48,185)	203,005
Issuance of Series A Preferred Shares, net of issuance cost	500,000	48,869	—	—				48,869
Accrual of coupon on Preferred Shares (note 10)	—	911	—	—	—	(911)	—	—
Stock-based compensation	—	—	—	7,972	6,886	—	—	14,858
Certain fair value adjustments to liability stock option awards (notes 3 and 12)	—	—	—	—	(540)	—	—	(540)
Issuance of common shares pursuant to exercise of options	—	—	40,156	262	(49)	—	—	213
Issuance of common shares pursuant to exercise of warrants	—	—	179,000	481	—	—	—	481
Net loss	—	—	—	—	—	(84,413)	—	(84,413)
Balance at December 31, 2017	500,000	$ 49,780	55,060,650	876,108	42,840	(738,070)	(48,185)	182,473
Issuance of Preferred Shares, net of issuance cost	664,000	66,265	—	—	—	—	—	66,265
Accrual of coupon on Preferred Shares (note 10)	—	10,091	—	—	—	(10,091)	—	—
Stock-based compensation	—	—	—	—	6,687	—	—	6,687
Certain fair value adjustments to liability stock option awards (notes 3 and 12)	—	—	—	—	472	—	—	472
Issuance of common shares pursuant to exercise of options	—	—	458,150	3,297	(1,915)	—	—	1,382
Currency translation adjustment	—	—	—	—	—	—	15	15
Net loss	—	—	—	—	—	(57,060)	—	(57,060)
Balance at December 31, 2018	**1,164,000**	**$ 126,136**	**55,518,800**	**$ 879,405**	**$ 48,084**	**$ (805,221)**	**$ (48,170)**	**$ 200,234**

See accompanying notes to the consolidated financial statements.

ARBUTUS BIOPHARMA CORPORATION

Consolidated Statements of Cash Flows

(Expressed in thousands of US Dollars, except share and per share amounts)

(Prepared in accordance with US GAAP)

	Year ended December 31,	
	2018	2017
OPERATING ACTIVITIES		
Net loss for the period	**$ (57,060)**	$ (84,413)
Items not involving cash:		
Deferred income tax benefit (notes 2 and 13)	**(4,282)**	(24,320)
Depreciation of property and equipment	**2,181**	2,027
Gain on sale of property and equipment	**(26)**	(3)
Stock-based compensation	**6,241**	15,117
Unrealized foreign exchange gains (losses)	**1,003**	(2,374)
Change in fair value of warrant liability	**—**	22
Change in fair value of contingent consideration	**(7,298)**	1,359
Impairment of intangible assets (note 6)	**14,811**	40,798
Site consolidation non-cash portion	**396**	—
Gain on equity investment	**(24,884)**	—
Equity investment loss	**5,327**	—
Net change in non-cash operating items:		
Accounts receivable	**(1,029)**	(129)
Accrued revenue	**128**	—
Investment tax credits receivable	**(49)**	(47)
Prepaid expenses and other assets	**(648)**	(833)
Accounts payable and accrued liabilities	**(1,266)**	736
Deferred revenue	**(2,742)**	2,727
Deferred rent and inducements	**—**	693
Site consolidation accrual	**1,331**	**—**
Net cash used in operating activities	**(67,866)**	(48,640)
INVESTING ACTIVITIES		
Disposition (acquisition) of investments	**(3,014)**	35,086
Proceeds from sale of property and equipment	**25**	3
Acquisition of property and equipment	**(1,138)**	(7,264)
Net cash provided by (used in) investing activities	**(4,127)**	27,825
FINANCING ACTIVITIES		
Promissory note repayment	**(12,001)**	—
Proceeds from sale of Preferred Shares, net of issuance costs	**66,265**	48,869
Issuance of common shares pursuant to exercise of options	**1,382**	100
Issuance of common shares pursuant to exercise of warrants	**—**	353
Net cash provided by financing activities	**55,646**	49,322
Effect of foreign currency rate changes on cash and cash equivalents	**(1,003)**	2,372
Increase in cash and cash equivalents	**(17,350)**	30,879
Cash and cash equivalents, beginning of period	**54,292**	23,413
Cash and cash equivalents, end of period	**$ 36,942**	$ 54,292
Supplemental cash flow information		
Preferred shares dividends accrued	**$ 10,091**	$ —
Investment in Genevant (note 4)	**$ 27,377**	$ —
Investment tax credits received	**$ —**	$ 108

See accompanying notes to the consolidated financial statements.

Notes to Consolidated Financial Statements
(Tabular amounts in thousands of US Dollars, except share and per share amounts)

1. Nature of business and future operations

Arbutus Biopharma Corporation (the “Company” or “Arbutus”) is a biopharmaceutical business dedicated to discovering, developing, and commercializing a cure for patients suffering from chronic hepatitis B infection, a disease of the liver caused by the hepatitis B virus (“HBV”). To pursue our strategy of developing a curative combination regimen, the Company has assembled a pipeline of multiple drug candidates with differing and complementary mechanisms of action targeting HBV.

The success of the Company is dependent on obtaining the necessary regulatory approvals to bring its products to market and achieve profitable operations. The Company's research and development activities and commercialization of its products are dependent on its ability to successfully complete these activities and to obtain adequate financing through a combination of financing activities and operations. It is not possible to predict either the outcome of the Company's existing or future research and development programs or the Company’s ability to continue to fund these programs in the future.

2. Significant accounting policies

Basis of presentation and principles of consolidation

Tekmira Pharmaceuticals Corporation ("Tekmira") was incorporated in Canada on October 6, 2005 as an inactive wholly-owned subsidiary of Inex Pharmaceuticals Corporation ("Inex"). Pursuant to a “Plan of Arrangement” effective April 30, 2007, the business and substantially all of the assets and liabilities of Inex were transferred to Tekmira.

On March 4, 2015, Tekmira completed a business combination pursuant to which OnCore Biopharma, Inc. ("OnCore"), became a wholly-owned subsidiary of Tekmira.

On July 31, 2015, Tekmira changed its corporate name to Arbutus Biopharma Corporation and OnCore changed its corporate name to Arbutus Biopharma, Inc. (“Arbutus Inc.”).

The Company has two wholly-owned subsidiaries as of December 31, 2018: Arbutus, Inc. and Arbutus Biopharma US Holdings, Inc., which was formed in 2018.

Protiva Biotherapeutics Inc. ("Protiva") was acquired by the Company on May 30, 2008. On January 1, 2018, Protiva was amalgamated with Arbutus Biopharma Corporation. The Company's former wholly-owned subsidiary, Protiva Agricultural Development Company Inc ("PADCo") was previously recorded by the Company using the equity method. On March 4, 2016, Monsanto Company exercised its option to acquire 100% of the outstanding shares of PADCo.

These consolidated financial statements include the accounts of the Company and its two wholly-owned subsidiaries, in accordance with U.S. generally accepted accounting principles ("GAAP"). All intercompany balances and transactions have been eliminated. Certain prior year amounts have been reclassified to conform to the current year presentation.

Foreign currency translation and functional currency conversion

Prior to January 1, 2016, the Company's functional currency was the Canadian dollar. Translation gains and losses from the application of the U.S. dollar as the reporting currency during the period that the Canadian dollar was the functional currency are included as part of cumulative currency translation adjustment, which is reported as a component of shareholders' equity under accumulated other comprehensive loss.

The Company re-assessed its functional currency and determined as of January 1, 2016, its functional currency was changed from the Canadian dollar to the U.S. dollar based on management's analysis of changes in the primary economic environment in which the Company operates. The change in functional currency is accounted for prospectively from January 1, 2016.

For periods commencing January 1, 2016, monetary assets and liabilities denominated in foreign currencies are translated into U.S. dollars using exchange rates in effect at the balance sheet date. Opening balances related to non-monetary assets and liabilities are based on prior period translated amounts, and non-monetary assets and non-monetary liabilities are translated at

the approximate exchange rate prevailing at the date of the transaction. Revenue and expense transactions are translated at the approximate exchange rate in effect at the time of the transaction. Foreign exchange gains and losses are included in the statement of operations and comprehensive loss as foreign exchange gains.

Use of estimates

The preparation of the consolidated financial statements in conformity with GAAP requires management to make estimates and assumptions about future events that affect the reported amounts of assets, liabilities, revenue, expenses, contingent assets and contingent liabilities as at the end or during the reporting period. Actual results could significantly differ from those estimates. Significant areas requiring the use of management estimates relate valuation of intangible assets and goodwill, recognition of revenue, stock-based compensation, and the amounts recorded as accrued liabilities, contingent consideration, and income tax recovery.

Cash and cash equivalents

Cash and cash equivalents are all highly liquid instruments with an original maturity of three months or less when purchased. Cash equivalents are recorded at cost plus accrued interest. The carrying value of these cash equivalents approximates their fair value.

Short-term investments

Short-term investments have original maturities exceeding three months and have remaining maturities less than one year. Short-term investments accrue interest daily based on a fixed interest rate for the term. The carrying value of these investments are recorded at cost plus accrued interest, which approximates their fair value. All investments are governed by the Company's Investment Policy approved by the Company's board of directors.

Equity method investment

The Company accounts for its investment in associated companies in accordance with the Financial Accounting Standards Board ("FASB") Accounting Standards Codification ("ASC") 323, *Investments - Equity Method and Joint Ventures* ("ASC 323"). In accordance with ASC 323, associated companies are accounted for as equity method investments. Results of associated companies are presented on a one-line basis. Investments in, and advances to, associated companies are presented on a one-line basis in the caption “Investment in Genevant” in the Company's consolidated balance sheets, net of allowance for losses, which represents the Company's best estimate of probable losses inherent in such assets. The Company's proportionate share of any associated companies' net income or loss is presented on a one-line basis in the caption "Equity investment (loss)" in the Company's consolidated statement of operations. Transactions between the Company and any associated companies are eliminated on a basis proportional to the Company's ownership interest. Financial results of Genevant Sciences Ltd. ("Genevant") are recorded on a one-quarter lag basis.

Property and equipment

Property and equipment is recorded at cost less impairment losses, accumulated depreciation, related government grants and investment tax credits. The Company records depreciation using the straight-line method over the estimated useful lives of the capital assets as follows:

	Useful life (years)		
Laboratory equipment		5	
Computer and office equipment	2	to	5
Furniture and fixtures		5	

Leasehold improvements are depreciated over their estimated useful lives but in no case longer than the lease term, except where lease renewal is reasonably assured.
If there is a major event indicating that the carrying value of property and equipment may be impaired then management will perform an impairment test and if the carrying value exceeds the recoverable value, based on undiscounted future cash flows, then such assets are written down to their fair values.

Goodwill and intangible assets

The costs incurred in establishing and maintaining patents for intellectual property developed internally are expensed in the period incurred.

Intangible assets consist of in-process research and development arising from the Company's acquisition of Arbutus Inc. in 2015 (see note 6). In-process research and development ("IPR&D") intangible assets are classified as indefinite-lived and are not amortized. IPR&D becomes definite-lived upon the completion or abandonment of the associated research and development efforts. Intangible assets with finite useful lives are amortized on a straight-line basis over their estimated useful lives, which are the respective patent terms. Amortization begins when intangible assets with finite lives are put into use. If there is a major event indicating that the carrying value of intangible assets may be impaired, then management will perform an impairment test in an interim period and if the carrying value exceeds the recoverable value, based on discounted future cash flows, then such assets are written down to their fair values.

The Company reviews the recoverable amount of intangible assets and goodwill on an annual basis, and the annual evaluation is performed as of December 31 each year. In addition, the Company evaluates for events or changes in the business that could indicate impairment and earlier testing. Such indicators include, but are not limited to, on an ongoing basis: (a) industry and market considerations such as increased competitive environment or adverse change in legal factors including an adverse assessment by regulators; (b) an accumulation of costs significantly in excess of the amount originally expected for the development of the asset; (c) current period operating or cash flow loss combined with a history of operating or cash flow losses or a projection or forecast that demonstrates continuing losses associated with the use of the asset; (d) adverse research and development program results; and (e) if applicable, a sustained decrease in share price.

Goodwill represents the excess of purchase price over the value assigned to the net tangible and identifiable intangible assets of Arbutus Inc. Goodwill has an indefinite accounting life and is therefore not amortized. Instead, goodwill is assessed for impairment on an annual basis, unless the Company identifies impairment indicators that would require earlier testing. For the period ended December 31, 2017, the Company elected to early adopt Accounting Standards Update ("ASU") 2017-04 – *Intangibles – Goodwill and Other (Topic 350): Simplifying the Test for Goodwill Impairment*, which simplifies the subsequent measurement of goodwill by eliminating Step 2 from the goodwill impairment test, which required a hypothetical purchase price allocation. A goodwill impairment will now be the amount by which a reporting unit's carrying value exceeds its fair value, not to exceed the carrying amount of goodwill. All other goodwill impairment guidance remains substantially unchanged, and management continues to have the ability to perform a qualitative assessment to determine if a quantitative impairment test is necessary. The Company performs its qualitative analysis using factors including but not limited to: (a) macroeconomic conditions; (b) industry and market considerations; (c) cost factors; (d) overall financial performance; (e) other relevant entity-specific events; (f) events affecting a reporting unit; and (g) if applicable, a sustained decrease in share price in absolute terms and relative to peers.

In the twelve months ended December 31, 2018, the Company disposed of a portion of its single reporting unit to Genevant. At that time, the Company allocated a portion of goodwill to its investment in Genevant based upon the relative fair value of Genevant to the Company as of April 11, 2018 (see note 4), as a result of which the carrying value of goodwill decreased by this same amount.

Revenue recognition

ASC 606, *Revenue From Contracts with Customers* ("ASC 606") became effective for the Company on January 1, 2018, and was adopted using the modified retrospective method under which previously presented financial statements are not restated and the cumulative effect of adopting ASC 606 on contracts in process is recognized by an adjustment to retained earnings at the effective date. The adoption of ASC 606 did not change recognized revenue under the Company's ongoing significant collaboration and license agreements and no cumulative effect adjustment was required.

ASC 606 requires an entity to recognize the amount of revenue to which it expects to be entitled for the transfer of promised goods or services to customers under a five-step model: (i) identify contract(s) with a customer; (ii) identify the performance obligations in the contract; (iii) determine the transaction price; (iv) allocate the transaction price to the performance obligations in the contract; and (v) recognize revenue when or as a performance obligation is satisfied.

The Company generates revenue primarily through collaboration agreements and license agreements. Such agreements may require the Company to deliver various rights and/or services, including intellectual property rights or licenses and research and development services. Under such agreements, the Company is generally eligible to receive non-refundable upfront payments, funding for research and development services, milestone payments, and royalties.

In contracts where the Company has more than one performance obligation to provide its customer with goods or services, each performance obligation is evaluated to determine whether it is distinct based on whether (i) the customer can benefit from the good or service either on its own or together with other resources that are readily available and (ii) the good or service is separately identifiable from other promises in the contract. The consideration under the contract is then allocated between the distinct performance obligations based on their respective relative stand-alone selling prices. The estimated stand-alone selling price of each deliverable reflects the Company's best estimate of what the selling price would be if the deliverable was regularly sold on a stand-alone basis and is determined by reference to market rates for the good or service when sold to others or by using an adjusted market assessment approach if the selling price on a stand-alone basis is not available.

The consideration allocated to each distinct performance obligation is recognized as revenue when control is transferred to the customer for the related goods or services. Consideration associated with at-risk substantive performance milestones, including sales-based milestones, is recognized as revenue when it is probable that a significant reversal of the cumulative revenue recognized will not occur. Sales-based royalties received in connection with licenses of intellectual property are subject to a specific exception in the revenue standards, whereby the consideration is not included in the transaction price and recognized in revenue until the customer’s subsequent sales or usages occur.

Leases and lease inducements

Leases are classified as either capital or operating leases. Leases which substantially transfer all benefits and risks of ownership of property to the Company are accounted for as capital leases. At the time a capital lease is entered into, an asset is recorded together with its related long-term obligation to reflect the purchase and financing. All other leases are accounted for as operating leases wherein rental payments are expensed as incurred. Lease inducements represent leasehold improvement allowances and reduced or free rent periods and are amortized on a straight-line basis over the term of the lease and are recorded as a reduction of rent expense. Sublease income resulting from the site consolidation is netted with lease expense for the facility after its cease-use date and the net amount is presented within site consolidation expense.

Research and development costs

Research and development costs, including acquired in-process research and development expenses for which there is no alternative future use, are charged as an expense in the period in which they are incurred.

Net loss attributable to common shareholders per share

The Company follows the two-class method when computing net loss attributable to common shareholders per share as the Company has issued Preferred Shares (note 10) that meet the definition of participating securities. The Company's Series A participating convertible preferred shares ("Preferred Shares") entitle the holders to participate in dividends but do not require the holders to participate in losses of the Company. Accordingly, if the Company reports a net loss attributable to holders of the Company's common shares, net losses are not allocated to holders of the Preferred Shares.

Net loss attributable to common shareholders per share is calculated based on the weighted average number of common shares outstanding. Diluted net loss attributable to common shareholders per share does not differ from basic net loss attributable to common shareholders per share for the years ended December 31, 2018 and 2017, since the effect of the Company’s stock options and warrants is anti-dilutive.

The following table sets out the computation of basic and diluted net loss attributable to common shareholders per share:

	For the year ended December 31			
	2018		2017	
Numerator:	**Common Shares**	**Preferred Shares**	Common Shares	Preferred Shares
Allocation of distributable earnings	**$ —**	**$ 10,091**	$ —	$ 911
Allocation of undistributed earnings (loss)	**(67,151)**	**—**	(85,324)	—
Allocation of earnings (loss) attributed to shareholders	**$ (67,151)**	**$ 10,091**	$ (85,324)	$ 911
Denominator:				
Weighted average number of shares - basic and diluted	**55,304,083**	**1,142,170**	54,723,272	104,110
Basic and diluted net loss attributable to shareholders per share	**$ (1.21)**	**$ 8.83**	$ (1.56)	$ 8.75

For the year ended December 31, 2018, potential common shares of 6,849,000 pertaining to stock options outstanding and 17,868,000 pertaining to if-converted preferred shares for a total of 24,717,000 were excluded from the calculation of income per common share because their inclusion would be anti-dilutive (December 31, 2017 total – 12,521,550).

Government grants and refundable investment tax credits

Government grants and tax credits provided for current expenses are included in the determination of income or loss for the year, as a reduction of the expenses to which they relate.

Deferred income taxes

Income taxes are accounted for using the asset and liability method of accounting. Deferred income taxes are recognized for the future income tax consequences attributable to differences between the carrying values of assets and liabilities and their respective income tax bases and for loss carry-forwards. Deferred income tax assets and liabilities are measured using enacted income tax rates expected to apply to taxable income in the periods in which temporary differences are expected to be recovered or settled. The effect on deferred income tax assets and liabilities of a change in tax laws or rates is included in earnings in the period that includes the enactment date. When realization of deferred income tax assets does not meet the more-likely-than-not criterion for recognition, a valuation allowance is provided.

Equity classified stock option awards

The Company grants stock options to employees, directors and consultants pursuant to share incentive plans described in note 12. Compensation expense is recorded for issued stock options using the fair value method with a corresponding increase in additional paid-in capital. Any consideration received on the exercise of stock options is credited to share capital.

The fair value of equity classified stock options is measured at the grant date and amortized on a straight-line basis over the vesting period.

Liability-classified stock option awards

The Company accounts for liability-classified stock option awards ("liability options") under ASC 718 - Compensation - Stock Compensation ("ASC 718"), under which awards of options that provide for an exercise price that is not denominated in: (a) the currency of a market in which a substantial portion of the Company's equity securities trades, (b) the currency in which the employee's pay is denominated, or (c) the Company's functional currency, are required to be classified as liabilities. Due to the change in functional currency as of January 1, 2016, certain stock option awards with exercise prices denominated in Canadian dollars changed from equity classification to liability classification. As such, the historic equity classification of these stock option awards changed to liability classification effective January 1, 2016. The change in classification resulted in reclassification of these awards from additional paid-in capital to liability-classified options.

Liability options are re-measured to their fair values at each reporting date with changes in the fair value recognized in share-based compensation expense or additional paid-in capital until settlement or cancellation. Under ASC 718, when an award is reclassified from equity to liability, if at the reclassification date the original vesting conditions are expected to be satisfied,

then the minimum amount of compensation cost to be recognized is based on the grant date fair value of the original award. Fair value changes below this minimum amount are recorded in additional paid-in capital.

Replacement awards

Replacement awards are share-based payment awards exchanged for awards held by employees of Arbutus Inc. As part of the Company's acquisition of Arbutus Inc., the Company's common shares were exchanged for Arbutus Inc.'s shares subject to repurchase rights held by Arbutus Inc.'s employees.

As at the date of acquisition of Arbutus Inc., the Company determined the total fair value of replacement awards and attributed a portion of the replacement awards to pre-combination service as part of the total acquisition consideration, and a portion to post-combination service, which is recognized as compensation expense over the expiry period of repurchase provision rights subsequent to the acquisition date.

The replacement awards consist of common shares that were issued upon the closing of the acquisition. Accordingly, as stock compensation expense related to these awards is recognized, share capital is increased by a corresponding amount. Replacement awards are excluded in the calculation of basic net income (loss) per common share until the repurchase rights have expired.

Warrants

The Company accounts for the warrants under the authoritative guidance on accounting for derivative financial instruments indexed to, and potentially settled in, a company's own stock, on the understanding that in compliance with applicable securities laws, the registered warrants require the issuance of registered securities upon exercise and do not sufficiently preclude an implied right to net cash settlement. The Company classifies warrants in its consolidated balance sheet as a liability which is revalued at each balance sheet date subsequent to the initial issuance. The Company uses the Black-Scholes pricing model to value the warrants. Determining the appropriate fair-value model and calculating the fair value of registered warrants requires considerable judgment. A small change in the estimates used may cause a relatively large change in the estimated valuation. The estimated volatility of the Company's common shares at the date of issuance, and at each subsequent reporting period, is based on historic fluctuations in the Company's stock price. The risk-free interest rate is based on the Government of Canada rate for bonds with a maturity similar to the expected remaining life of the warrants at the valuation date. The expected life of the warrants is based on the historical pattern of exercises of warrants.

Preferred Shares

The Company accounts for Preferred Shares under ASC 480 – *Distinguishing Liabilities from Equity* ("ASC 480"), which provides guidance for equity instruments with conversion features. The Company classifies Preferred Shares in its consolidated balance sheet wholly as equity, with no bifurcation of conversion feature from the host contract, given that the Preferred Shares cannot be cash settled and the redemption features, which include a fixed conversion ratio with predetermined timing and proceeds, are within the Company's control. The Company accrues for the 8.75% per annum compounding accrual at each reporting period end date as an increase to share capital, and an increase to deficit.

Segment information

The Company operates in a single reporting segment. Substantially all of the Company's revenues to date were earned from customers or collaborators based in the United States. Substantially all of the Company's premises, property and equipment are located in Canada and the United States.

Recent accounting pronouncements

ASC 606, *Revenue From Contracts with Customers* ("ASC 606") became effective for the Company on January 1, 2018, and was adopted using the modified retrospective method under which previously presented financial statements are not restated and the cumulative effect of adopting ASC 606 on contracts in process is recognized by an adjustment to retained earnings at the effective date. The adoption of ASC 606 did not change the Company's recognized revenue under its ongoing significant collaboration and license agreements and no cumulative effect adjustment was required.

In August 2016, the FASB issued ASU No. 2016-15, Statement of Cash Flows (Topic 230): Classification of Certain Cash Receipts and Cash Payments ("ASU 2016-15"). ASU 2016-15 clarifies certain aspects of the statement of cash flows, and aims

to reduce diversity in practice regarding how certain transactions are classified in the statement of cash flows. ASU 2016-15 was effective as of January 1, 2018 and was adopted by the Company in the first quarter of 2018. The adoption of ASU 2016-15 did not have a material impact on the Company's condensed consolidated balance sheets or condensed consolidated statements of operations and comprehensive income (loss).

In November 2016, the FASB issued ASU No. 2016-18, Statement of Cash Flows (Topic 230): Restricted Cash ("ASU 2016-18") that clarifies how entities should present restricted cash in the statement of cash flows. Under ASU 2015-18, changes in total cash, inclusive of restricted cash, should be reflected in the statement of cash flows. As a result, transfers between cash and restricted cash are no longer reflected as activity within the statement of cash flows. The Company adopted ASU 2016-18 on January 1, 2018. The adoption of ASU 2018-18 did not have a material impact on the Company's condensed consolidated statements of cash flows.

In October 2016, the FASB issued ASU No. 2016-16, Income Taxes (Topic 740): Intra-Entity Transfer of Assets Other Than Inventory ("ASU 2016-16"). ASU 2016-16 eliminates the deferral of the tax effects of intra-entity asset transfers other than inventory. As a result, the income tax consequences from the intra-entity transfer of an asset other than inventory and associated changes to deferred taxes will be recognized when the transfer occurs. The Company adopted ASU 2016-16 in the first quarter of 2018. The adoption of ASU 2016-16 did not have a material impact on the Company's condensed consolidated balance sheets or condensed consolidated statements of operations and comprehensive income (loss).

In June 2018, the FASB issued ASU No. 2018-07, Compensation-Stock Compensation (Topic 718), Improvements to Nonemployee Share-Based Payment Accounting ("ASU 2018-07"). ASU 2018-07 provides guidance about aligning nonemployee and employee share-based payment accounting. ASU 2018-07 is effective for all entities for annual periods, and interim periods within those annual periods, beginning after December 15, 2018. The Company early adopted the new standard as of January 1, 2018. The adoption of ASU 2018-07 did not have a material impact on the Company's condensed consolidated balance sheets or condensed consolidated statements of operations and comprehensive income (loss).

Accounting pronouncements not yet adopted

In February 2016, the FASB issued ASU No. 2016-02, *Leases* (Topic 842), which generally requires the recognition of operating and financing lease liabilities with corresponding right-of-use assets on the balance sheet. The Company adopted the new standard on January 1, 2019 using the modified retrospective basis applied at the effective date of the new standard and elected to utilize a package of practical expedients. The new lease standard only impacts the Company's three property leases. The Company continues to evaluate and finalize the effect of adopting this guidance on our consolidated financial statements and related disclosures.

In November 2018, the FASB issued targeted amendments to Topic 808, *Collaborative Arrangements*, and Topic 606, *Revenue from Contracts with Customers*, to clarify that certain transactions between parties to collaborative arrangements should be accounted for in accordance with FASB revenue guidance when the counterparty is a customer. This guidance also prohibits the presentation of collaborative arrangements as revenues from contracts with customers if the counterparty is not a customer. This guidance, which is required to be applied retrospectively and is effective for interim and annual periods beginning after December 15, 2019, with early adoption permitted, is not expected to have an impact on the Company’s consolidated financial statements.

3. Fair value measurements

The Company measures certain financial instruments and other items at fair value.

To determine the fair value, the Company uses the fair value hierarchy for inputs used in measuring fair value that maximizes the use of observable inputs and minimizes the use of unobservable inputs by requiring that the most observable inputs be used when available. Observable inputs are inputs market participants would use to value an asset or liability and are developed based on market data obtained from independent sources. Unobservable inputs are inputs based on assumptions about the factors market participants would use to value an asset or liability. The three levels of inputs that may be used to measure fair value are as follows:

- Level 1 inputs are quoted market prices for identical instruments available in active markets.
- Level 2 inputs are inputs other than quoted prices included within Level 1 that are observable for the asset or liability either directly or indirectly. If the asset or liability has a contractual term, the input must be observable for substantially the full term. An example includes quoted market prices for similar assets or liabilities in active markets.

- Level 3 inputs are unobservable inputs for the asset or liability and will reflect management's assumptions about market assumptions that would be used to price the asset or liability.

Assets and liabilities are classified based on the lowest level of input that is significant to the fair value measurements. Changes in the observability of valuation inputs may result in a reclassification of levels for certain securities within the fair value hierarchy.

The carrying values of cash and cash equivalents, short-term investments, accounts receivable and accounts payable and accrued liabilities approximate their fair values due to the immediate or short-term maturity of these financial instruments.

As quoted prices for the warrants are not readily available, the Company has used a Black-Scholes pricing model to estimate fair value. These are level 3 inputs as defined above.

To determine the fair value of the contingent consideration (note 15), the Company uses a probability weighted assessment of the likelihood the milestones would be met and the estimated timing of such payments, and then the potential contingent payments were discounted to their present value using a probability adjusted discount rate that reflects the early stage nature of the development program, time to complete the program development, and overall biotech indices. The Company determined the fair value of the contingent consideration was $3,126,000 and the decrease of $7,298,000 has been recorded in other losses in the statement of operations and comprehensive loss for the year ended December 31, 2018. The assumptions used in the discounted cash flow model are level 3 inputs as defined above.

The following tables present information about the Company's assets and liabilities that are measured at fair value on a recurring basis, and indicates the fair value hierarchy of the valuation techniques used to determine such fair value:

		Level 1	Level 2	Level 3		December 31, 2018
Assets						
Cash and cash equivalents	$	36,942	—	—	$	36,942
Short-term investments		87,675	—	—		87,675
Restricted investment		—	—	—		—
Total	$	124,617	—	—	$	124,617
Liabilities						
Liability-classified stock option awards		—	—	479		479
Contingent consideration		—	—	3,126		3,126
Total		—	—	3,605	$	3,605

		Level 1	Level 2	Level 3		December 31, 2017
Assets						
Cash and cash equivalents	$	54,292	—	—	$	54,292
Guaranteed investment certificates		72,060	—	—		72,060
Restricted investment		12,601	—	—		12,601
Total	$	138,953	—	—	$	138,953
Liabilities						
Liability-classified stock option awards		—	—	1,239		1,239
Contingent consideration		—	—	10,424		10,424
Total		—	—	$ 11,663	$	11,663

The following table presents the changes in fair value of the Company's warrants:

	Liability at beginning of the period	Fair value of warrants exercised in the period	Increase (decrease) in fair value of warrants	Foreign exchange loss	Liability at end of the period
Year ended December 31, 2017	$ 107	$ (129)	$ 22	$ —	$ —
Year ended December 31, 2018	$ —	$ —	$ —	$ —	$ —

The following table presents the changes in fair value of the Company's liability-classified stock option awards:

	Liability at beginning of the period	Fair value of liability-classified stock option awards exercised in the period	Increase (decrease) in fair value of liability	Liability at end of the period
Year ended December 31, 2017	$ 553	$ (103)	$ 789	$ 1,239
Year ended December 31, 2018	$ 1,239	$ (93)	$ (667)	$ 479

The following table presents the changes in fair value of the Company's contingent consideration:

	Contingent consideration at beginning of the period	Increase in fair value of contingent consideration	Contingent consideration at end of the period
Year ended December 31, 2017	$ 9,065	$ 1,359	$ 10,424
Year ended December 31, 2018	$ 10,424	$ (7,298)	$ 3,126

4. Equity method investment

On April 11, 2018, the Company entered into an agreement (the "Genevant Agreement") with Roivant Sciences Ltd.("Roivant") to launch Genevant Sciences Ltd. ("Genevant"), a company focused on the discovery, development, and commercialization of a broad range of RNA-based therapeutics enabled by the Company's proprietary lipid nanoparticle ("LNP") and ligand conjugate delivery technologies.

Under the terms of the Genevant Agreement, the Company contributed a license for the delivery technologies and fixed assets. The fixed assets had a carrying value of $600,000. The contributed license provides Genevant with exclusive rights to the LNP and ligand conjugate delivery platforms for RNA-based applications outside of HBV. Roivant contributed $37,500,000 in transaction-related seed capital to Genevant, consisting of an initial capital contribution of $22,500,000 and a subsequent investment of $15,000,000 at a pre-determined, stepped-up valuation. The Company retains all rights to the LNP and ligand conjugate delivery platforms for HBV, and is entitled to a tiered low single-digit royalty from Genevant on future sales of products enabled by those delivery platforms. The Company also retains the entirety of its royalty entitlement on the commercialization of Alnylam Pharmaceutical, Inc.'s ("Alnylam") Onpattro.

The Company determined that, since the Genevant Agreement stipulates that significant decisions relating to the management of Genevant must be shared between the Company and Roivant, the Company does not control Genevant but does exercise significant influence over it and, will therefore, account for its investment in Genevant using the equity method. On April 11, 2018, the Company and Roivant each received a 50% ownership interest in Genevant. As a result of a pre-determined, subsequent investment in Genevant by Roivant and other parties, as contemplated in the initial agreement, as of December 31, 2018, the Company owned approximately 40% of the common equity of Genevant.

The Company's contribution of licenses related to the delivery technologies and fixed assets in exchange for an equity interest in Genevant resulted in a gain of $24,884,000 during the second quarter of 2018. The gain reflected the fair value of the equity in Genevant received by the Company less the $600,000 carrying value of the fixed assets contributed by the Company and $1,893,000 of goodwill allocated to Genevant based upon the relative fair value of Genevant to the Company as of April 11, 2018. The fair value of equity in Genevant received by the Company was based on a valuation performed by external valuation specialists.

The following table provides a summary of the Company's investment in Genevant for the year ended December 31, 2018, in thousands:

		Year ended December 31, 2018
Beginning balance	$	—
Initial investment in Genevant		27,377
Share of stock based compensation for Genevant employees who continue to vest in Arbutus stock options		159
Share of net loss (on a one-quarter lag basis)		(5,206)
Dilution loss		(122)
Share of comprehensive loss - currency translation adjustment		16
Ending balance	$	22,224

The basis difference between the Company’s carrying value in Genevant and the Company’s share of Genevant's net assets is attributed primarily to indefinite-lived IPR&D (the delivery technology transferred to Genevant).

The following table summarizes unaudited financial information for our equity method investee and is reported on a one quarter lag.

		2018
Balance Sheet:		
Current assets	$	32,027
Non-current assets		1,644
Total assets		33,671
Current liabilities		4,911
Non-current liabilities		253
Shareholders' equity		28,507
Total liabilities and shareholders' equity	$	33,671

		2018
Results of Operations:		
Revenue	$	—
Gross profit		—
Operating Loss		(12,421)
Net Loss	$	(12,770)

5. Property and equipment

December 31, 2018		Cost		Accumulated depreciation		Net book value
Lab equipment	$	5,420	$	(2,455)	$	2,965
Leasehold improvements		9,308		(2,401)		6,907
Computer hardware and software		2,313		(2,040)		273
Furniture and fixtures		—		—		—
	$	17,041	$	(6,896)	$	10,145

December 31, 2017		Cost		Accumulated depreciation		Net book value
Lab equipment	$	9,567	$	(5,325)	$	4,242
Leasehold improvements		12,578		(5,139)		7,439
Computer hardware and software		2,318		(1,878)		440
Furniture and fixtures		391		(329)		62
	$	24,854	$	(12,671)	$	12,183

During 2018, the Company disposed of certain fixed assets in connection with the closure of the Burnaby facility. The fixed assets had a net book value of $0.3 million ($6.2 million at cost, net of $5.9 million of accumulated depreciation) related to the closure of the Burnaby facility. The Company also transferred certain assets to Genevant in 2018 with a net book value of $0.6 million ($1.1 million at cost, net of $0.5 million of accumulated depreciation).

6. Intangible assets and goodwill

All IPR&D acquired is currently classified as indefinite-lived and is not currently being amortized. IPR&D becomes definite-lived upon the completion or abandonment of the associated research and development efforts, and will be amortized from that

time over an estimated useful life based on respective patent terms. The Company evaluates the recoverable amount of intangible assets on an annual basis and performs an annual evaluation of goodwill as of December 31 each year, unless there is an event or change in the business that could indicate a requirement to test at an interim period, in which case earlier testing is performed.

Intangible assets impairment evaluation

During the year-ended December 31, 2018, the Company recorded an intangible assets impairment charge of $14,811,000 and a corresponding income tax benefit of $4,282,000 related to the decrease in deferred tax liability for the indefinite delay of further development of its AB-423 program in the capsid inhibitor drug class as a result of the Company's decision to advance its second generation capsid agent into the HBV patient portion of its phase 1 clinical trial.

During the year-ended December 31, 2017, the Company recorded a total impairment charge of $40,798,000 for the discontinuance of the stimulator of interferon genes (“STING”) agonists. This charge represents the remaining value of the acquired Immune Modulator drug class. In addition, the Company recorded an income tax benefit of $16,926,000 corresponding to the impairment charge - see note 13.

The following table summarizes the carrying values, net of impairment of the intangible assets as at December 31, 2018:

Year ended December 31,		**2018**		**2017**
IPR&D – Immune Modulators	**$**	**—**	$	—
IPR&D – Antigen Inhibitors		**—**		14,811
IPR&D – cccDNA Sterilizers		**43,836**		43,836
Total IPR&D	**$**	**43,836**	$	58,647

Annual impairment evaluation of goodwill

The Company has one reporting unit for goodwill purposes given that resource allocation and performance is largely driven by consolidated metrics. In addition, there is limited discrete financial information available and reviewed below the consolidated level.

Goodwill represents the excess of purchase price over the value assigned to the net tangible and identifiable intangible assets of Arbutus Inc.

In April 2018, the Company allocated $1,893,000 of goodwill to its investment in Genevant based upon the relative fair value of Genevant to the Company (see note 4), as a result of which the carrying value of goodwill decreased by this same amount. As of December 31, 2018, the Company performed a qualitative assessment and did not identify any indicators of impairment of goodwill, and therefore no impairment charge on goodwill was recorded during the twelve months then ended December 31, 2018 (twelve months ended December 31, 2017 - $0). The intangible impairment charge of $14,811,000 described above represents a discrete, program specific event and was not considered to be an indicator of impairment of goodwill.

The Company determines the fair value of the reporting unit using accepted valuation methods, including the use of discounted cash flows supplemented by market-based assessments of fair value. The income approach is used for the quantitative assessment to estimate the fair value of the reporting unit, which requires estimating future cash flows and risk-adjusted discount rates in the Company's discounted cash flow model. The overall market outlook and cash flow projections of the reporting unit involves the use of key assumptions, including cash flows, discount rates and probability of success. Due to uncertainties in the estimates that are inherent to the Company's industry, actual results could differ significantly from the estimates made. Many key assumptions in the cash flow projections are interdependent on each other. A change in any one or combination of these assumptions could impact the estimated fair value of the reporting unit. See note 2 for additional discussion of the Company's policy for accounting for goodwill.

7. Accounts payable and accrued liabilities

Accounts payable and accrued liabilities was comprised of the following:

	December 31, 2018	December 31, 2017
Trade accounts payable	**$ 3,192**	$ 1,987
Payroll accruals	**2,341**	2,893
Research and development accruals	**2,716**	4,937
Professional fee accruals	**871**	429
Deferred lease inducements	**—**	42
Other accrued liabilities	**309**	358
	$ 9,429	$ 10,646

8. Site consolidation

On February 8, 2018, the Company announced a site consolidation and organizational restructuring to align its HBV business in Warminster, PA, by reducing its global workforce by approximately 35% and by closing its Burnaby facility. In March 2018, the Company began executing its site consolidation plan and began to incur related costs.

The Company estimates that the total expenses to complete the site consolidation will be approximately $5,600,000. Included in the site consolidation plan is the payment of one-time employee termination benefits, employee relocation costs, and site closure costs, which were primarily paid in cash in the second quarter of 2018. In addition, as of June 30, 2018 the Company ceased to use its Burnaby facility. The Company has entered into subleases with various tenants, including Genevant, for a portion of the Burnaby facility. The Company does not, however, expect the subleasing income to completely cover the costs under the lease to which the Company remains the primary obligor. Therefore, the Company has recognized the remaining committed cost, less sublease income currently under contract, in site consolidation expenses.

The Company accounts for site consolidation expense in accordance with ASC 420, *Exit or Disposal Cost Obligations ("ASC 420")*. ASC 420 specifies that a liability for a cost associated with an exit or disposal activity be recognized when the liability is incurred, except for a liability where employees are required to render service until they are terminated in order to receive termination benefits and will be retained to render service beyond the minimum retention period. A liability for such one-time termination benefits shall be measured initially at the communication date based on the fair value of the liability as of the termination date and recognized ratably over the future service period.

The following table shows expenses for the twelve months ended December 31, 2018 and the liability as of December 31, 2018, in thousands:

Description of expense	**Twelve months ended December 31, 2018**
Employee severance	$ 2,851
Employee relocation	823
Lease and facility	1,123
Total site consolidation expense	**4,797**
Amounts paid and adjustments	(3,466)
Accrued balance	**$ 1,331**

9. Loan payable

The Company had a bank loan of $12,001,000 in the form of a promissory note for the purpose of financing its operations and expanding its laboratory facilities in the U.S. The loan accrued interest daily at a rate of one-month London Interbank Offered Rate (LIBOR) plus 1.25% per annum. The maturity date of the loan was December 27, 2019. The loan was secured by the Company's cash of $12,601,000 and was restricted from use until the loan was settled in full. The Company invested the restricted cash in a two-year fixed certificate of deposit with a bank and was presented as restricted investment in the Company's balance sheet for the period ended December 31, 2017. In March 2018, the Company repaid the loan and accrued interest in full, resulting in the release of $12,601,000 from restricted cash to short-term investments on the Company's condensed consolidated balance sheet.

10. Shareholders' equity

Authorized share capital

The Company’s authorized share capital consists of an unlimited number of common shares and 1,164,000 preferred shares without par value.

Open Market Sale Agreement

In December 2018, we entered into an Open Market Sale Agreement (“Sale Agreement”) with Jefferies LLC, under which we may issue and sell common shares, from time to time, for an aggregate sales price of up to $50.0 million. We have not sold any shares under the Sale Agreement during the year ended December 31, 2018.

Series A Preferred Shares

On October 2, 2017, the Company announced that it entered into a subscription agreement with Roivant for the sale of Preferred Shares to Roivant for gross proceeds of $116,400,000. The Preferred Shares are non-voting and are convertible into common shares at a conversion price of $7.13 per share (which represents a 15% premium to the closing price of $6.20 per share). The purchase price for the Preferred Shares plus an amount equal to 8.75% per annum, compounded annually, will be subject to mandatory conversion into common shares on October 18, 2021 (subject to limited exceptions in the event of certain fundamental corporate transactions relating to Arbutus’ capital structure or assets, which would permit earlier conversion at Roivant’s option). Assuming conversion of the Preferred Shares into common shares, based on the number of common shares outstanding on December 31, 2018, Roivant would hold 49.6% of the Company's common shares. Roivant has agreed to a four year lock-up period for this investment and its existing holdings in Arbutus. Roivant has also agreed to a four year standstill whereby Roivant will not acquire greater than 49.99% of the Company's common shares or securities convertible into common shares.

The initial investment of $50,000,000 closed on October 16, 2017, and the remaining amount of $66,400,000 closed on January 12, 2018 following regulatory and shareholder approvals.

The Company records the Preferred Shares wholly as equity under ASC 480, with no bifurcation of conversion feature from the host contract, given that the Preferred Shares cannot be cash settled and the redemption features are within the Company's control, which include a fixed conversion ratio with predetermined timing and proceeds. The Company accrues for the 8.75% per annum compounding coupon at each reporting period end date as an increase to share capital, and an increase to deficit (see statement of stockholder's equity).

Warrants to purchase common shares

The Company has no outstanding warrants as of December 31, 2018 and December 31, 2017. During the year ended December 31, 2017, there were 179,000 warrants exercised for $353,000 in cash. In March 2017, the remaining balance of 22,000 of the Company's warrants expired. The decrease in fair value from the previous balance sheet date relating to the expired warrants was included in the total decrease in fair value of warrant liability in the Company's statement of net loss and comprehensive loss for the year ended December 31, 2017.

11. Collaborations, contracts and licensing agreements

The following tables set forth revenue recognized under collaborations, contracts and licensing agreements:

	Year ended December 31	
	2018	2017
Alexion (a)	**$ —**	$ 7,956
Gritstone (b)	**4,318**	2,499
Other milestone and royalty payments (c)	**1,627**	245
Total revenue	**$ 5,945**	$ 10,700

The following table sets forth deferred collaborations and contracts revenue:

	Year ended December 31	
	2018	2017
Gritstone (b)	**$ —**	$ 2,727
Other	**—**	15
Total deferred revenue	**$ —**	$ 2,742

(a) License Agreement with Alexion Pharmaceuticals, Inc.

On March 16, 2017, the Company signed a license agreement with Alexion Pharmaceuticals, Inc. ("Alexion") that entitles Alexion to research, develop, manufacture, and commercialize products with the Company's LNP technology in their single orphan disease target. In consideration for the rights granted under the agreement, the Company received a $7,500,000 non-refundable upfront cash payment, as well as payments for services provided. This upfront payment was amortized over the period of expected benefit.

On July 27, 2017, the Company received notice of termination from Alexion for the Company's LNP license agreement. The termination was driven by a strategic review of Alexion's business and research and development portfolio, which included a decision to discontinue development of mRNA therapeutics. The $7,500,000 upfront payment received in March 2017 is non-refundable, and the Company has recorded the upfront payment as well as any revenue and costs related to closeout procedures in the statement of operations and comprehensive loss for the period ended December 31, 2017.

(b) License agreement with Gritstone Oncology, Inc.

On October 16, 2017, the Company entered into a license agreement with Gritstone Oncology, Inc. ("Gritstone") that entitles Gritstone to research, develop, manufacture and commercialize products with the Company’s LNP technology. The Company received an upfront payment in November 2017, and is eligible to receive future potential payments including research services, development and commercial milestone payments and royalty payments on future product sales. As a result of the Company's agreement with Genevant (see note 3 for details), from April 11, 2018 going forward Genevant is entitled to 50% of the revenues earned by the Company from Gritstone and the Company will record revenues on a net basis.

The Company determined the deliverables under the Agreements included the rights and license granted, involvement in the joint steering committee, and other services provided, as determined under the research plan. The license and involvement in the joint steering committee have been determined by the Company to not have standalone value. Therefore, these deliverables are treated as one unit of accounting and recognized as revenue over the performance period as the Company transfers the technical "know-how" for the customized formulations.

The Company has determined that other materials and services provided have standalone value. The relative fair values are estimated upon the execution of each activity and charged at rates comparable to market with embedded margins on each service activity.

Milestone payments that are not within the control of the Company or the licensee, such as regulatory approvals, are not considered probable of being achieved until those approvals are received.

As a result of the Company's agreement with Genevant (see note 4 for details), from April 11, 2018 going forward, Genevant is entitled to 50% of the revenues earned by the Company from Gritstone. The Company is the agent in this arrangement and

records revenue on a net basis. In 2018, Gritstone paid a development milestone payment of $2,500,000 pursuant to the license agreement. The Company recorded revenue of $1,250,000, net of the portion paid to Genevant.

(c) Other milestone and royalty payments

Alnylam Pharmaceuticals, Inc.

In 2012, the Company entered into a license agreement with Alnylam that entitles Alnylam to develop and commercialize products with the Company's LNP technology. During the third quarter of 2018, Alnylam's Onpattro™, which utilizes the Company's LNP technology, was approved by the Food and Drug Administration ("FDA") in the United States and the European Medicines Agency. See Item 1 - Business for additional information. In 2018, the Company recorded revenue of $750,000 for development milestones related to FDA approval and the first commercial sale of Onpattro™. Additionally, the Company retains full rights to low to mid single-digit royalties on global sales of Onpattro™. The Company received the first royalty payment for sales of Onpattro™ from Alnylam in the fourth quarter of 2018.

Acuitas Therapeutics Inc.

Consistent with the terms of the settlement agreement signed in November 2012, the Company finalized and entered a cross-license agreement with Acuitas Therapeutics, Inc. ("Acuitas") in December 2013. The terms of the cross-license agreement provide Acuitas with access to certain of the Company's earlier IP generated prior to mid-April 2010 in the fields of gene replacement therapy and antisense. Acuitas may only grant access to the Company's LNP technology to its partners if it is part of a product sublicense. At the same time, the terms provide the Company with certain access to Acuitas' technology and licenses in the RNAi field, along with a percentage of each milestone and royalty payment with respect to certain products. Acuitas has agreed that it would not compete in the RNAi field for a period of five years, ending in November 2017. The Company considered Acuitas to be in material breach of their cross-license agreement and in February 2018, the Company and Acuitas reached a settlement terminating Acuitas' right to further use or sublicense Arbutus' LNP technology. Please refer to "Item 3. Legal Proceedings" for additional information.

Spectrum Pharmaceuticals, Inc.

In May 2006, the Company signed a number of agreements with Talon Therapeutics, Inc. ("Talon", formerly Hana Biosciences, Inc.) including the grant of worldwide licenses (the "Talon License Agreement") for three of the Company's chemotherapy products, Marqibo®, Alocrest ™ (Optisomal Vinorelbine) and Brakiva ™ (Optisomal Topotecan).

In 2012, Talon had received approval for Marqibo from the FDA for the treatment of adult patients with Philadelphia chromosome negative acute lymphoblastic leukemia in second or greater relapse or whose disease has progressed following two or more anti-leukemia therapies. Marqibo is a liposomal formulation of the chemotherapy drug, vincristine. In 2012, the Company received a milestone of $1,000,000 based on the FDA's approval of Marqibo and receives royalty payments based on Marqibo's commercial sales. There are no further milestones related to Marqibo but the Company is eligible to receive total milestone payments of up to $18,000,000 on Alocrest and Brakiva. Talon was acquired by Spectrum Pharmaceuticals, Inc. in July 2013. The acquisition did not affect the terms of the license between Talon and the Company.

United States Government's Department of Defense to develop TKM-Ebola

On July 14, 2010, the Company signed a contract with the Department of Defense ("DoD") to advance TKM-Ebola, an RNAi therapeutic utilizing the Company's LNP technology to treat Ebola virus infection.

Under the contract, the Company was reimbursed for costs incurred, including an allocation of overhead costs, and was paid an incentive fee. At the beginning of the fiscal year, the Company estimated its labor and overhead rates for the year ahead. At the end of the year the actual labor and overhead rates are calculated and revenue is adjusted accordingly. The Company's actual labor and overhead rates differed from its estimated rates based on actual costs incurred and the proportion of the Company's efforts on contracts and internal products versus indirect activities. Within minimum and maximum collars, the amount of incentive fee the Company earned under the contract was variable based on costs incurred versus budgeted costs. During the contractual period, incentive fee revenue and total costs were impacted by management's estimate and judgments which were continuously reviewed and adjusted as necessary using the cumulative catch-up method. From the year ended December 31, 2015 onwards, the Company believed it could reliably estimate the final contract costs so recognized the portion of expected incentive fee which had been earned to date.

On October 1, 2015, the Company received formal notification from the DoD that, due to the unclear development path for TKM-Ebola and TKM-Ebola-Guinea, the Ebola-Guinea Manufacturing and the Ebola-Guinea IND submission statements of work had been terminated, subject to the completion of certain post-termination obligations. The TKM-Ebola portion of the contract was completed in November 2015. In 2018 the Company concluded contract close out procedures with the DoD.

12. Stock-based compensation

Awards outstanding and available for issuance

Combining all of the Company's share-based compensation plans, at December 31, 2018, the Company has 6,848,861 options outstanding and a further 3,158,353 Awards available for issuance.

At the Company's annual general and special meeting of shareholders on May 19, 2016, the shareholders of the Company approved the adoption of the Company's 2016 Omnibus Share and Incentive Plan (the "2016 Plan") and the reserve of 5,000,000 common shares of the Company issuable pursuant to awards under the 2016 Plan.

In June 2011, the shareholders of the Company approved the 2011 Omnibus Share Compensation Plan, as amended in May 2016 (the "2011 Plan"), which still remains in effect. The 2011 Plan replaced the 2007 Omnibus Compensation Plan (the "2007 Plan"). The 2007 Plan continued to govern the options granted thereunder. No further options were granted under the Company's 2007 Plan.

Under the 2016 and 2011 Plans, the Company's board of directors may grant options, and other types of Awards, to employees, directors and consultants of the Company. The exercise price of the options is determined by the Company's Board of Directors but will be at least equal to the closing market price of the common shares the date of grant and the term may not exceed 10 years. Options granted generally vest over three years for employees and for directors' initial grants, and immediately for directors' annual grants.

Additionally, the Company granted a total of 200,000 options in 2013 to two executive officers in conjunction with their new appointments as executive officers. These options were granted in accordance with the policies of the Toronto Stock Exchange and pursuant to newly designated share compensation plans (the "Designated Plans"). During 2016, one of the two executive officers departed from the Company, and the unexercised options under his Designated Plan expired. No new options can be granted under the Designated Plans. The Designated Plan is governed by substantially the same terms as the 2011 Plan. 150,000 options were outstanding for one of the Company's former executive officers as of December 31, 2018, all of which expired unexercised in February 2019.

Hereafter, information on options governed by the 2016 Plan, the 2011 Plan, the 2007 Plan and the Designated Plans (the "Arbutus Plans") is presented on a consolidated basis as the terms of the plans are similar. Information on the Protiva Option Plan and the OnCore Option Plan are presented separately.

Stock option activity for the Arbutus Plans

Equity-classified stock option activity:

	Number of optioned common shares	Weighted average exercise price	Aggregate intrinsic value
Balance, December 31, 2016	2,911,204	8.53	56
Options granted	2,026,500	3.20	
Options exercised	(11,105)	3.45	13
Options forfeited, canceled or expired	(208,272)	11.41	
Balance, December 31, 2017	4,718,327	$ 6.06	$ 5,842
Options granted	2,557,669	$ 5.87	
Options exercised	(357,072)	$ 3.60	$ 1,142
Options forfeited, canceled or expired	(587,836)	$ 6.71	
Balance, December 31, 2018	6,331,088	$ 6.05	$ 1,170

Options under the Arbutus Plans expire at various dates from March 15, 2019 to December 10, 2028.

The following table summarizes information pertaining to stock options outstanding at December 31, 2018 under the Arbutus Plans:

			Options outstanding December 31, 2018			Options exercisable December 31, 2018	
Range of Exercise prices (US$)			Number of options outstanding	Weighted average remaining contractual life (years)	Weighted average exercise price (US$)	Number of options exercisable	Weighted average exercise price (US$)
$1.54	to	$3.22	1,541,466	8.1	3.13	545,966	3.09
$3.23	to	$3.92	340,252	6.4	3.57	248,750	3.57
$3.93	to	$3.96	1,084,991	7.2	3.94	729,085	3.94
$3.97	to	$4.96	369,850	9.1	4.41	51,833	3.99
$4.97	to	$5.34	1,464,204	9.3	5.20	61,450	5.20
$5.35	to	$12.55	769,075	8.4	8.09	222,208	7.95
$12.56	to	$17.57	761,250	6.1	16.44	761,250	16.44
$1.54	to	$17.57	6,331,088	8.0	$ 6.05	2,620,542	$ 7.73

At December 31, 2018, there were 2,620,542 options exercisable (December 31, 2017 - 1,520,131). The weighted average remaining contractual life of exercisable options as of December 31, 2018 was 6.77 years. The aggregate intrinsic value of in-the-money options exercisable at December 31, 2018 was $469,111 (December 31, 2017 -$1,098,000.)

A summary of the Company’s non-vested stock option activity and related information for the year ended December 31, 2018 is as follows:

	Number of optioned common shares	Weighted average fair value
Non-vested at December 31, 2017	3,198,196	$ 3.23
Options granted	2,557,669	4.08
Options vested	(1,584,733)	4.36
Non-vested options forfeited	(460,586)	2.82
Non-vested at December 31, 2018	3,710,546	$ 3.39

The weighted average remaining contractual life for options expected to vest at December 31, 2018 was 8.0 years and the weighted average exercise price for these options was $6.05 per share.

The aggregate intrinsic value of options expected to vest as of December 31, 2018 was $1,169,784 (December 31, 2017 - $5,842,000).

The total fair value of options that vested during the year ended December 31, 2018 was $6,913,360 (December 31, 2017 - $5,657,000).

Valuation assumptions for the Arbutus Plans

On March 3, 2015, the Company voluntarily de-listed from the Toronto Stock Exchange. All stock options granted after March 3, 2015 were denominated in US dollars based on the Company's stock price on the Nasdaq Global Select Market. The methodology and assumptions used to estimate the fair value of stock options at date of grant under the Black-Scholes option-pricing model remain unchanged. Assumptions on the dividend yield are based on the fact that the Company has never paid cash dividends and has no present intention to pay cash dividends. Assumptions about the Company’s expected stock-price volatility are based on the historical volatility of the Company’s publicly traded stock. The risk-free interest rate used for each grant is equal to the zero coupon rate for instruments with a similar expected life. Expected life assumptions are based on the Company’s historical data. The Company recognizes forfeitures as they occur, and the effects of forfeitures are reflected in stock-based compensation expense recorded in the statement of operations and comprehensive loss for the years ended

December 31, 2018 and 2017, respectively. The weighted average option pricing assumptions for options granted during the year are as follows:

	Year ended December 31	
	2018	2017
Dividend yield	**—%**	—%
Expected volatility	**75.26%**	73.05%
Risk-free interest rate	**2.81%**	1.28%
Expected average option term	**6.7 years**	6.9 years

Liability-classified stock option activity:

Due to the change in the Company's functional currency as of January 1, 2016, certain stock option awards with exercise prices denominated in Canadian dollars changed from equity classification to liability classification - see note 2.

Valuation assumptions

Liability options are re-measured to their fair values at each reporting date, using the Black-Scholes valuation model. The methodology and assumptions prevailing at the re-measurement date used to estimate the fair values of liability options remain unchanged from the date of grant of equity classified stock option awards. Assumptions about the Company’s expected stock-price volatility are based on the historical volatility of the Company’s publicly traded stock. The risk-free interest rate used for each grant is equal to the zero coupon rate for instruments with a similar expected life. Expected life assumptions are based on the Company’s historical data. The weighted average Black-Scholes option-pricing assumptions and the resultant fair values as of December 31, 2018 and December 31, 2017, are presented in the following table:

	December 31, 2018	**December 31, 2017**
Stock price	**$ 3.83**	**$ 5.05**
Dividend yield	**—%**	—%
Expected volatility	**75.20%**	70.31%
Risk-free interest rate	**2.48%**	2.10%
Expected average term (years)	**2.2**	4.3
Weighted average fair value per share of options outstanding	**$ 1.27**	$ 2.75
Fair value of vested liability-classified options (in thousands)	**$ 479**	$ 1,239

Stock option activity for liability options

	Number of optioned common shares	Weighted average exercise price	Aggregate intrinsic value (in thousands)
Balance, December 31, 2017	451,500	$ 5.78	$ 525
Options exercised	(30,000)	1.73	71
Options forfeited, canceled, or expired	(44,000)	3.63	—
Balance, December 31, 2018	377,500	$ 5.81	$ 224

Liability options expire at various dates from January 27, 2020 to February 4, 2024.

The following table summarizes information pertaining to liability options outstanding at December 31, 2018:

			Options outstanding December 31, 2018			Options exercisable December 31, 2018	
Range of Exercise prices (US$)			Number of options outstanding	Weighted average remaining contractual life (years)	Weighted average exercise price	Number of options exercisable	Weighted average exercise price
$1.25	to	$2.29	80,000	2.8	$ 1.50	80,000	$ 1.50
$2.60	to	$3.30	35,000	1.9	2.82	35,000	2.82
$3.31	to	$5.23	40,000	3.8	3.78	40,000	3.78
$5.24	to	$7.93	150,000	4.8	6.69	150,000	6.69
$7.94	to	$10.60	17,500	2.6	9.18	17,500	9.18
$10.61	to	$12.03	55,000	5.1	12.03	55,000	12.03
$1.25	to	$12.03	377,500	3.9	$ 5.82	377,500	$ 5.82

As of December 31, 2018, all liability options were fully vested.

Protiva Option Plan

In May 2008, as a condition of the acquisition of Protiva, a total of 350,457 common shares of the Company were reserved for the exercise of 519,073 Protiva share options (“Protiva Options”). Upon exercise, each option was converted into approximately 0.6752 shares of the Company (the same ratio at which Protiva common shares were exchanged for Company common shares at completion of the acquisition of Protiva). The Protiva Options had an exercise price of C$0.30 and were fully vested and exercisable as of May 30, 2008. The Protiva Plan expired on March 1, 2018 when the last outstanding options were exercised.

The following table sets forth outstanding options under the Protiva Option Plan:

	Number of Protiva Options	Equivalent number of Company common shares	Weighted average exercise price (C$)	Weighted average exercise price (US$)
Balance, December 31, 2016	46,000	31,058	0.30	0.22
Options exercised	(6,000)	(4,051)	0.30	0.23
Options forfeited, canceled or expired	—	—	—	N/A
Balance, December 31, 2017	40,000	27,007	0.30	0.24
Options exercised	(40,000)	(27,007)	0.30	0.24
Options forfeited, canceled or expired	—	—	—	N/A
Balance, December 31, 2018	—	—	$ —	$ —

The intrinsic value of Protiva Options exercised in the year ended December 31, 2018 was $132,000 (2017 - $10,000).

OnCore Option Plan

As of the acquisition date in March 2015, the Company reserved 184,332 shares for the future exercise of OnCore stock options. The total fair value of OnCore stock options at the date of acquisition has been determined to be $3,287,000, using the Black-Scholes pricing model with an assumed risk-free interest rate of 0.97%, volatility of 78%, a zero dividend yield and an expected life of 8 years, which are consistent with the assumption inputs used by the Company to determine the fair value of its options. Of the total fair value, $1,127,000 has been attributed as pre-combination service and included as part of the total acquisition consideration. The post-combination attribution of $2,160,000 was recognized as compensation expense over the vesting period of the stock options through to December 2018.

Following the merger, the Company is not permitted to grant any further options under the OnCore Option Plan. The Company has included $524,872 of compensation expense related to the vesting of OnCore stock options for the year ended December 31, 2018.

The following table sets forth outstanding options under the OnCore Option Plan:

	Number of OnCore Options	Equivalent number of Company common shares	Weighted average exercise price (US$)
Balance, December 31, 2017	183,040	184,332	$ 0.57
Options exercised	(43,750)	(44,059)	0.58
Options forfeited, canceled or expired	—	—	N/A
Balance, December 31, 2018	139,290	140,273	$ 0.56

At December 31, 2018, there were 139,290 OnCore options (140,273 Arbutus equivalent) exercisable with a weighted average exercise price of $0.56. The weighted average remaining contractual life of exercisable options as at December 31, 2018 was 5.9 years. The aggregate intrinsic value of in-the-money options exercisable at December 31, 2018 was $458,319.

A summary of the OnCore Option Plan's non-vested stock option activity and related information for the year ended December 31, 2018 is as follows:

	Number of OnCore Options	Equivalent number of Company common shares	Weighted average fair value (US$)
Non-vested at December 31, 2017	32,128	32,354	$ 17.83
Options vested	(32,128)	(32,354)	17.83
Non-vested options forfeited	—	—	N/A
Non-vested at December 31, 2018	—	—	$ 17.83

The total fair value of options that vested during the year ended December 31, 2018 was $576,942.

Stock-based compensation expense

Total stock-based compensation expense is comprised of: (1) the vesting options awarded to employees under the Arbutus and OnCore option plans calculated in accordance with the fair value method as described above; and (2) the expiration of repurchase rights related to the post-combination service portion of the total fair value of shares issued to Arbutus Inc.'s employees.

The total stock-based compensation has been recorded in the consolidated statement of operations and comprehensive income (loss) as follows:

	Year ended December 31	
	2018	2017
Research, development, collaborations and contracts expenses	**$ 2,670**	$ 9,236
General and administrative expenses	**3,337**	5,881
Total	**$ 6,007**	$ 15,117

At December 31, 2018, there remains $9,126,000 of unearned compensation expense related to unvested equity employee stock options to be recognized as expense over a weighted-average period of approximately 18 months.

Replacement awards

Included in the total consideration paid in the Company's acquisition of Arbutus Inc. were common shares issued as replacement awards, which were subject to repurchase provisions. The total fair value of these common shares attributed to the post acquisition period was approximately $56,934,000 and was recognized as compensation expense over the expiry period of repurchase provision rights subsequent to the acquisition date.

During 2017, all remaining repurchase provision rights expired and the Company recorded compensation expense of $7,972,000.

13. Income taxes

Income tax (recovery) expense varies from the amounts that would be computed by applying the combined Canadian federal and provincial income tax rate of 27% (2017 - 26%) to the loss before income taxes as shown in the following tables:

	Year ended December 31,	
	2018	2017
Computed taxes (recoveries) at Canadian federal and provincial tax rates	$ (19,287)	$ (28,270)
Difference due to change in tax rate on opening deferred taxes	—	(6,633)
Permanent and other differences	396	1,476
Change in valuation allowance - other	13,062	6,945
Difference due to income taxed at foreign rates	(138)	(966)
Stock-based compensation	1,685	3,128
Impairment of goodwill	—	—
Deferred income tax recovery	**$ (4,282)**	$ (24,320)

On December 22, 2017, the Tax Cuts and Jobs Act (the “2017 Tax Act”) was signed into law making significant changes to the Internal Revenue Code. Changes include, but are not limited to, a federal corporate tax rate decrease from 35% to 21% for tax years beginning after December 31, 2017. Certain income tax effects of the 2017 Tax Act, principally due to the write-down of our net deferred tax assets, are reflected in our financial results. We have remeasured certain deferred tax assets and liabilities based on the rates at which they are expected to reverse in the future, which is generally 21%. The STET amount recorded related to the re-measurement of our deferred tax assets was a reduction of $8.3 million to deferred tax liabilities and a reduction of $3.6 million to our deferred tax assets, which have a full valuation allowance provided against them. However, we are still analyzing certain aspects of the Act and refining our calculations, which could potentially affect the measurement of these balances or potentially give rise to new deferred tax amounts.

As at December 31, 2018, the Company has investment tax credits available to reduce Canadian federal income taxes of $8,784,000 (December 31, 2017 - $9,546,000) and provincial income taxes of $4,002,000 (December 31, 2017 - $4,866,000), expiring between 2026 and 2036. In addition, the Company has research and development credits of $4,265,000 (December 31, 2017 - $3,639,000) available for indefinite carry-forward, which can be used to reduce future taxable income in the U.S.

At December 31, 2018, the Company has scientific research and experimental development expenditures of $61,493,000 (December 31, 2017 - $61,493,000) available for indefinite carry-forward and $182,256,000 (December 31, 2017 - $124,451,000) of net operating losses due to expire between 2027 and 2037 and which can be used to offset future taxable income in Canada.

As of December 31, 2018, the Company has $11,040,000 (December 31, 2017 - $13,723,000) of net operating losses due to expire in 2035 and which can be used to offset future taxable income in the U.S. Future use of a portion of the U.S. loss carry-forwards is subject to limitations under the Internal Revenue Code Section 382.

As a result of ownership changes occurring on October 1, 2014 and March 4, 2015, the Company's ability to use these losses may be limited. Losses incurred to date may be further limited if a subsequent change in control occurs.

Significant components of the Company’s deferred tax assets and liabilities are shown below:

	As at December 31,	
	2018	**2017**
Deferred tax assets (liabilities):		
Non-capital loss carryforwards	**$ 51,575**	**$ 36,652**
Research and development deductions	**15,803**	**16,603**
Book amortization in excess of tax	**(608)**	**(650)**
Share issue costs	**307**	**456**
Revenue recognized for tax purposes in excess of revenue recognized for accounting purposes	**—**	**1,162**
Tax value in excess of accounting value in lease inducements	**147**	**173**
Federal investment tax credits	**9,686**	**9,079**
Provincial investment tax credits	**3,955**	**4,819**
In-process research and development	**(12,664)**	**(16,943)**
Upfront license fees	**283**	**311**
Equity accounted for investment	**37**	**—**
Other	**2,503**	**2,017**
Total deferred tax assets (liabilities)	**71,024**	**53,679**
Valuation allowance	**(83,685)**	**(70,622)**
Net deferred tax assets (liabilities)	**$ (12,661)**	**$ (16,943)**

14. Refundable investment tax credits

Refundable investment tax credits have been recorded as a reduction in research and development expenses.

The Company's estimated claim for refundable Scientific Research and Experimental Development investment tax credits for the year ended December 31, 2018 is $18,000 (2017 - $183,000).

15. Contingencies and commitments

Property lease

The total minimum rent and estimated operating cost commitment, net of lease inducements, for our head office and leased facilities in Warminster, Pennsylvania is as follows, in thousands:

Year ended December 31, 2019	$ 746
Year ended December 31, 2020	766
Year ended December 31, 2021	787
Year ended December 31, 2022 and after	3,813
	$ 6,112

The Company's lease expense for the year ended December 31, 2018 was $1,789,000 has been recorded in the consolidated statements of operations and comprehensive loss (2017 of $1,653,000)

Product development partnership with the Canadian Government

The Company entered into a Technology Partnerships Canada ("TPC") agreement with the Canadian Federal Government on November 12, 1999. Under this agreement, TPC agreed to fund 27% of the costs incurred by the Company, prior to March 31, 2004, in the development of certain oligonucleotide product candidates up to a maximum contribution from TPC of $7,179,000 (C$9,330,000). As at December 31, 2018, a cumulative contribution of $2,714,000 (C$3,702,000) had been received and the Company does not expect any further funding under this agreement. In return for the funding provided by TPC, the Company agreed to pay royalties on the share of future licensing and product revenue, if any, that is received by the Company on certain non-siRNA oligonucleotide product candidates covered by the funding under the agreement. These royalties are payable until a certain cumulative payment amount is achieved or until a pre-specified date. In addition, until a cumulative amount equal to the funding actually received under the agreement has been paid to TPC, the Company agreed to pay 2.5% royalties on any royalties the Company receives for Marqibo. For the year ended December 31, 2018, the Company earned royalties on Marqibo sales in the amount of $154,000 ((2017- 191,000 (see note 11(d)), resulting in $4,000 recorded by the Company as royalty payable to TPC (2017 - $5,000). The cumulative amount paid or accrued up to December 31, 2018 was $26,000, resulting in the contingent amount due to TPC being $2,690,000 (C$3,669,000).

Arbitration with the University of British Columbia

Certain early work on lipid nanoparticle delivery systems and related inventions was undertaken at the University of British Columbia (“UBC”). These inventions are licensed to the Company by UBC under a license agreement, initially entered in 1998 as amended in 2001, 2006 and 2007. The Company has granted sublicenses under the UBC license to Alnylam. Alnylam has in turn sublicensed back to the Company the licensed UBC patents for discovery, development and commercialization of siRNA products. Certain sublicenses were also granted to other parties.

On November 10, 2014, UBC filed a demand for arbitration against the Company and on January 16, 2015, filed a Statement of Claim, which alleges entitlement to $3,500,000 in allegedly unpaid royalties based on publicly available information, and an unspecified amount based on non-public information. UBC also seeks interest and costs, including legal fees. The Company filed its Statement of Defense to UBC's Statement of Claims, as well as filed a Counterclaim involving a patent application that the Company alleges UBC wrongly licensed to a third party rather than to the Company. The Company seeks license payments for said application, and an exclusive worldwide license to said application. The proceeding has been divided into three phases, with the first hearing taking place in June 2017. The arbitrator determined in the first phase which agreements are sublicense agreements within UBC's claim, and which are not. In the first phase, UBC updated its alleged entitlement from $3,500,000 originally claimed to seek $10,900,000 in alleged unpaid royalties, plus interest arising from payments as early as 2008. No finding was made as to whether any licensing fees are due to UBC under these agreements; this will be the subject of the second phase of arbitration which is scheduled during the second quarter of 2019. The arbitrator also held that the patent application that is the subject of the Counterclaim was not required to be licensed to Arbutus. A schedule for the third phase of the arbitration has not yet been set. Arbitration and related matters are costly and may divert the attention of the Company's management and other resources that would otherwise be engaged in other activities. However, the Company notes that arbitration is subject to inherent uncertainty and an arbitrator could rule against the Company. The Company has not recorded an estimate of the possible loss associated with this arbitration, due to the uncertainties related to both the likelihood and amount of any possible loss or range of loss. Costs related to the arbitration have been recorded in the statement of operations and comprehensive loss by the Company as incurred.

Litigation with Acuitas

In August 2017, the Company provided Acuitas with notice that it considered Acuitas to be in material breach of the cross-license agreement. The cross-license agreement provides that it may be terminated upon any material breach by the other party 60 days after receipt of written notice of termination describing the material breach in reasonable detail. In October 2016, Acuitas filed a Notice of Civil Claim in the Supreme Court of British Columbia seeking an order that the Company perform its obligations under the Cross License Agreement, for damages ancillary to specific performance, injunctive relief, interest and costs. The Company disputed Acuitas’ position, and filed a Counterclaim seeking a declaration that Acuitas is in breach of the cross-license agreement, and claiming injunctive relief, damages, interest and costs.

In January 2017, the Company filed an application seeking an order to enjoin Acuitas from, among other things, entering into any further agreements purporting to sublicense Arbutus’ technology from the date of the order to the date of trial or further order from the Court. In February 2017, the Company announced that the Supreme Court of British Columbia granted its request for a pre-trial injunction against Acuitas, preventing Acuitas from further sublicensing of the Company's LNP technology until the end of October, or further order of the Court. Under the terms of the pre-trial injunction, Acuitas is

prevented from entering into any new agreements which include sublicensing of the Company's LNP. In March 2017, Acuitas sought leave to appeal from the injunction decision and in April 2017, the appeal was denied. In September 2017, the injunction order was extended by consent to March 2, 2018. In February 2018, the contractual issues concerning the cross-license agreement (excluding the claims for damages) were settled out of court, resulting in the termination of Acuitas' rights to further use or sublicense our LNP technology, making permanent the effect of the Court's prior injunction.

Arbitration and related matters are costly and may divert the attention of the Company's management and other resources that would otherwise be engaged in other activities. Costs related to the arbitration are recorded by the Company as incurred.

Contingent consideration from Arbutus Inc. acquisition of Enantigen Therapeutics, inc. and License Agreements between Enantigen Therapeutics, Inc. and Baruch S. Blumberg Institute and Drexel University

In October 2014, Arbutus Inc. acquired all of the outstanding shares of Enantigen Therapeutics, Inc. ("Enantigen") pursuant to a stock purchase agreement. Through this transaction, Arbutus Inc. acquired a HBV surface antigen secretion inhibitor program and a capsid assembly inhibitor program, each of which are now assets of Arbutus, following it's merger with Arbutus Inc.

Under the stock purchase agreement, Arbutus Inc. agreed to pay up to a total of $21,000,000 to Enantigen's selling stockholders upon the achievement of certain triggering events related to HBV therapies. The first triggering event is enrollment of the first patient in a Phase 1b clinical trial utilizing the acquired assets in HBV patients. Due to the indefinite deferral of further development of AB-423, the Company believes this triggering event is not likely to occur in the next twelve-month period.

The regulatory, development and sales milestone payments had an estimated fair value of approximately $6,727,000 as at the date of acquisition of Arbutus Inc., and were treated as contingent consideration payable in the purchase price allocation. The contingent consideration was calculated based on information available at the date of acquisition, using a probability weighted assessment of the likelihood the milestones would be met and the estimated timing of such payments, and then the potential contingent payments were discounted to their present value using a probability adjusted discount rate that reflects the early stage nature of the development program, time to complete the program development, and market comparatives.

Contingent consideration is a financial liability and measured at its fair value at each reporting period, with any changes in fair value from the previous reporting period recorded in the statement of operations and comprehensive loss (see note 2).

Drexel University and The Baruch S. Blumberg Institute

In February 2014, Arbutus Inc. entered into a license agreement with The Baruch S. Blumberg Institute ("Blumberg") and Drexel University ("Drexel") that granted an exclusive, worldwide, sub-licensable license to three different compound series: cccDNA inhibitors, capsid assembly inhibitors and HCC inhibitors.

In partial consideration for this license, Arbutus Inc. paid a license initiation fee of $150,000 and issued warrants to Blumberg and Drexel. The warrants were subsequently exercised in 2014. Under this license agreement, Arbutus Inc. also agreed to pay up to $3,500,000 in development and regulatory milestones per licensed compound series, up to $92,500,000 in sales performance milestones per licensed product, and royalties in the mid-single digits based upon the proportionate net sales of licensed products in any commercialized combination. The Company is obligated to pay Blumberg and Drexel a double-digit percentage of all amounts received from the sub-licensees, subject to customary exclusions.

In November 2014, Arbutus Inc. entered into an additional license agreement with Blumberg and Drexel pursuant to which it received an exclusive, worldwide, sub-licensable license under specified patents and know-how controlled by Blumberg and Drexel covering epigenetic modifiers of cccDNA and STING agonists. In consideration for these exclusive licenses, Arbutus Inc. made an upfront payment of $50,000. Under this agreement, the Company will be required to pay up to $1,000,000 for each licensed product upon the achievement of a specified regulatory milestone and a low single-digit royalty, based upon the proportionate net sales of compounds covered by this intellectual property in any commercialized combination. The Company is also obligated to pay Blumberg and Drexel a double digit percentage of all amounts received from its sub-licensees, subject to exclusions.

Research Collaboration and Funding Agreement with Blumberg

In October 2014, Arbutus Inc. entered into a research collaboration and funding agreement with Blumberg under which the Company will provide $1,000,000 per year of research funding for three years, renewable at the Company's option for an additional three years, for Blumberg to conduct research projects in HBV and liver cancer pursuant to a research plan to be agreed upon by the parties. Blumberg has exclusivity obligations to the Company with respect to HBV research funded under the agreement. In addition, the Company has the right to match any third party offer to fund HBV research that falls outside the scope of the research being funded under the agreement. Blumberg has granted the Company the right to obtain an exclusive, royalty-bearing, worldwide license to any intellectual property generated by any funded research project. If the Company elects to exercise its right to obtain such a license, the Company will have a specified period of time to negotiate and enter into a mutually agreeable license agreement with Blumberg. This license agreement will include the following pre negotiated upfront, milestone and royalty payments: an upfront payment in the amount of $100,000; up to $8,100,000 upon the achievement of specified development and regulatory milestones; up to $92,500,000 upon the achievement of specified commercialization milestones; and royalties at a low single to mid-single digit rates based upon the proportionate net sales of licensed products from any commercialized combination.

In June 2016, the Company and Blumberg entered into an amended and restated research collaboration and funding agreement, primarily to: (i) increase the annual funding amount to Blumberg from $1,000,000 to $1,100,000; (ii) extend the initial term through to October 29, 2018; (iii) provide an option for the Company to extend the term past October 2018 for two additional one year terms; and (iv) expand the Company's exclusive license under the Agreement to include the sole and exclusive right to obtain an exclusive, royalty-bearing, worldwide and all-fields license under Blumberg's rights in certain other inventions described in the agreement. The amended agreement expired in October 2018, at the end of its initial term.

In November 2018, we entered into a new two-year master services agreement with Blumberg that expires in November 2020. The new agreement replaces all rights and obligations of the prior research collaboration and funding agreements, as amended. Under the new agreement, Blumberg will perform specific research activities based upon statements of work and we will no longer provide a fixed amount of funding to Blumberg. In November and December 2018, we executed statements of work with Blumberg for an aggregate cost of $750,000.

16. Related Party Transactions

During 2018, the Company purchased certain research and development services from Roivant, which are billed at agreed hourly rates and reflective of market rates for such services. The total cost of these services was $644,000 during 2018 and is included in the income statement under research, development, collaborations and contracts expenses.

During 2018, the Company purchased certain research and development services from its equity method investee, Genevant. These services are billed at agreed hourly rates and reflective of market rates for such services. The total cost of these services was $398,000 during 2018 and are included in the income statement under research, development, collaborations and contracts expenses. Conversely, Genevant purchased certain administrative and transitional services from the Company totaling $226,000 during 2018 and was netted against research, development, collaborations and contracts expenses in the income statement. In addition, Genevant has a sublease for 17,900 square feet in the Company's Burnaby facility. Estimated sublease income from Genevant to the completion of the Burnaby lease of $466,000 was netted against site consolidation costs in 2018 (see note 8).

17. Concentrations of business risk

Credit risk

Credit risk is defined by the Company as an unexpected loss in cash and earnings if a collaborative partner is unable to pay its obligations in due time. The Company's main source of credit risk is related to its accounts receivable balance which principally represents temporary financing provided to collaborative partners in the normal course of operations.

The Company does not currently maintain a provision for bad debts as the majority of accounts receivable are from collaborative partners or government agencies and are considered low risk.

The carrying amount of financial assets represents the maximum credit exposure. The maximum exposure to credit risk at December 31, 2018 was the accounts receivable balance of $1,431,000 (2017 - $402,000).

All accounts receivable balances were current as at December 31, 2018 and December 31, 2017.

Significant collaborators and customers risk

We depend on a small number of collaborators and customers for a significant portion of our revenues (see note 11).

Liquidity Risk

Liquidity risk results from the Company's potential inability to meet its financial liabilities, for example payments to suppliers. The Company ensures sufficient liquidity through the management of net working capital and cash balances.

The Company's liquidity risk is primarily attributable to its cash and cash equivalents, and short-term investments. The Company limits exposure to liquidity risk on its liquid assets through maintaining its cash and cash equivalent, and short-term investments with high-credit quality financial institutions. Due to the nature of these investments, the funds are available on demand to provide optimal financial flexibility.

The Company believes that its current sources of liquidity are sufficient to cover its likely applicable short term cash obligations. The Company's financial obligations include accounts payable and accrued liabilities which generally fall due within 45 days. The net liquidity of the Company is considered to be the cash and cash equivalents and short-term investments less accounts payable and accrued liabilities.

		December 31, 2018		December 31, 2017
Cash, cash equivalents and short-term investments	**$**	**124,617**	$	126,352
Less: Accounts payable and accrued liabilities		**(9,429)**		(10,646)
	$	**115,188**	$	115,706

Foreign currency risk

The results of the Company's operations are subject to foreign currency transaction and translation risk as the Company's revenues and expenses are denominated in both Canadian and US dollars. The fluctuation of the Canadian dollar in relation to the US dollar will consequently have an impact upon the Company's reported income or loss and may also affect the value of the Company's assets, liabilities, and the amount of shareholders' equity both as recorded in the Company's financial statements, in the US functional currency, and as reported, for presentation purposes, in the US dollar.

The Company manages its foreign currency risk by using cash received in a currency to pay for expenses in that same currency, whenever possible. The Company's policy to maintain US and Canadian dollar cash and investment and short-term investment balances based on long term forecasts of currency needs thereby creating a natural currency hedge.

The Company has not entered into any agreements or purchased any instruments to hedge possible currency risks. The Company's exposure to Canadian dollar currency expressed in US dollars was as follows:

		December 31, 2018		December 31, 2017
Cash and cash equivalents and short-term investments	**$**	**1,427**	$	25,921
Accounts receivable		**293**		375
Accrued revenue		**—**		—
Accounts payable and accrued liabilities		**—**		(1,273)
	$	**1,720**	$	25,023

An analysis of the Company's sensitivity to foreign currency exchange rate movements is not provided in these financial statements as the Company's Canadian dollar cash holdings and expected Canadian dollar revenues are sufficient to cover Canadian dollar expenses for the foreseeable future.

18. Interim financial data (unaudited)

	2018				
	Q1	Q2	Q3	Q4	**Total**
Revenue	$ 1,436	$ 1,244	$ 1,587	$ 1,678	**$ 5,945**
Loss from operations	(18,405)	(22,046)	(32,426)	(16,903)	**(89,780)**
Net loss	$ (17,429)	$ 3,091	$ (24,473)	$ (18,249)	**$ (57,060)**
Net loss attributable to common shares	(19,765)	550	(27,040)	(20,896)	**(67,151)**
Basic net income/(loss) per common share	$ (0.36)	$ 0.01	$ (0.49)	$ (0.38)	**$ (1.21)**
Diluted net income/(loss) per common share	$ (0.36)	$ 0.01	$ (0.49)	$ (0.38)	**$ (1.21)**

	2017				
	Q1	Q2	Q3	Q4	**Total**
Revenue	$ 235	$ 1,039	$ 6,892	$ 2,534	**$ 10,700**
Loss from operations	(18,299)	(19,485)	(12,897)	(60,249)	**(110,930)**
Net loss	$ (18,627)	$ (18,255)	$ (11,600)	$ (35,931)	**$ (84,413)**
Net loss attributable to common shares	$ (18,627)	$ (18,255)	$ (11,600)	$ (36,842)	**$ (85,324)**
Basic and diluted net loss per common share	$ (0.34)	$ (0.33)	$ (0.21)	$ (0.67)	**$ (1.56)**

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

None.

Item 9A. Controls and Procedures

Disclosure Controls and Procedures

Our management, including our principal executive officer and principal financial officer, has evaluated the effectiveness of the design and operation of our disclosure controls and procedures (as defined in Rules 13a-15(e) and 15d-15(e) under the Securities Exchange Act of 1934, as amended (the “Exchange Act”)), as of the end of the period covered by this Annual Report on Form 10-K. Based upon that evaluation, our Chief Executive Officer (our principal executive officer) and Chief Financial Officer (our principal financial officer), concluded that, as of December 31, 2018, our disclosure controls and procedures were effective to provide reasonable assurance that (a) the 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, and (b) such information is accumulated and communicated to our management, including our Chief Executive Officer and Chief Financial Officer, as appropriate, to allow timely decisions regarding required disclosure.

In designing and evaluating our disclosure controls and procedures, our management recognized that any controls and procedures, no matter how well designed and operated, can provide only reasonable assurance of achieving the desired control objectives, and our management necessarily was required to apply its judgment in evaluating the cost-benefit relationship of possible controls and procedures.

Management’s Annual Report on Internal Control over Financial Reporting

Management is responsible for establishing and maintaining adequate internal control over financial reporting, as such term is defined in Exchange Act Rules 13a-15(f) and 15d-15(f). Under the supervision and with the participation of our management, including our principal executive officer and our principal financial officer, we conducted an evaluation of the effectiveness of our internal control over financial reporting based on the framework in the Internal Control - Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission (“COSO 2013”).

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

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate. Based on our evaluation under the framework in COSO 2013, our management concluded that our internal control over financial reporting was effective as of December 31, 2018.

Attestation Report of the Registered Public Accounting Firm

The independent registered public accounting firm’s report on the effectiveness of our internal control over financial reporting, is included in Item 8 of this annual report on Form 10-K and is incorporated herein by reference.

Changes in Internal Control over Financial Reporting

There have not been changes in our internal control over financial reporting during the quarter ended December 31, 2018 that have materially affected or are reasonably likely to materially affect the Company's internal control over financial reporting.

Item 9B. Other Information

None.

PART III

Item 10. Directors, Executive Officers and Corporate Governance

The information required by this item is incorporated herein by reference to our Proxy Statement for the 2019 Annual General Meeting of the Stockholders to be filed with the SEC within 120 days of the fiscal year ended December 31, 2018.

We have adopted a code of business conduct for directors, officers and employees (the "Code of Conduct"), which is available on our website at http://investor.arbutusbio.com/corporate-governance-0 and also at www.sedar.com. We intend to satisfy the disclosure requirement under Item 5.05 of Form 8-K regarding any amendment to, or waiver from, a provision of this Code of Conduct and by posting such information on the website address and location specified above.

Item 11. Executive Compensation

The information required by this item is incorporated herein by reference to our Proxy Statement for the 2019 Annual General Meeting of the Stockholders to be filed with the SEC within 120 days of the fiscal year ended December 31, 2018.

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

The information required by this item is incorporated herein by reference to our Proxy Statement for the 2019 Annual General Meeting of the Stockholders to be filed with the SEC within 120 days of the fiscal year ended December 31, 2018.

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

The information required by this item is incorporated herein by reference to our Proxy Statement for the 2019 Annual General Meeting of the Stockholders to be filed with the SEC within 120 days of the fiscal year ended December 31, 2018.

Item 14. Principal Accounting Fees and Services

The information required by this item is incorporated herein by reference to our Proxy Statement for the 2019 Annual General Meeting of the Stockholders to be filed with the SEC within 120 days of the fiscal year ended December 31, 2018.

PART IV

Item 15. Exhibits and Financial Statement Schedules

Exhibit Number	Description
2.1*	Agreement and Plan of Merger and Reorganization, dated January 11, 2015, by and among Tekmira Pharmaceuticals Corporation, TKM Acquisition Corporation and OnCore Biopharma, Inc. (incorporated herein by reference to Exhibit 2.1 to the Registrant's Current Report on Form 8-K/A filed with the SEC on January 26, 2015).
3.1*	Notice of Articles and Articles of the Company, as amended.(incorporated herein by reference to Exhibit 3.1 to the Registrant's Annual Report on Form 10-K for the year ended December 31, 2017, filed with the SEC on March 16, 2018).
3.2*	Amendment to Articles of the Company (incorporated herein by reference to Exhibit 3.1 to the Registrant's Quarterly Report on Form 10-Q for the quarter ended September 30, 2018, filed with the SEC on November 7, 2018).
4.1*	Governance Agreement between the Company and Roivant Sciences Ltd., a Bermuda exempted company, dated January 11, 2015 (incorporated herein by reference to Exhibit 2.1 to the Registrant's Current Report on Form 8-K/A filed with the SEC on January 26, 2015).
10.1†*	Amended and Restated License Agreement, between Inex Pharmaceuticals Corporation and Hana Biosciences, Inc., dated April 30, 2007 (incorporated herein by reference to Exhibit 4.2 to the Registrant's Amendment No. 1 to Form 20-F for the year ended December 31, 2010 filed with the SEC on January 31, 2012).
10.2†*	Amendment No. 1 to the Amended and Restated Agreement, between the Company (formerly Inex Pharmaceuticals Corporation) and Hana Biosciences, Inc., effective as of May 27, 2009 (incorporated herein by reference to Exhibit 4.1 to the Registrant's Annual Report on Form 20-F for the year ended December 31, 2010 filed with the SEC on June 3, 2011).
10.3†*	Amendment No. 2 to the Amended and Restated Agreement, between the Company (formerly Inex Pharmaceuticals Corporation) and Hana Biosciences, Inc., effective as of September 20, 2010 (incorporated herein by reference to Exhibit 4.21 to the Registrant's Annual Report on Form 20-F for the year ended December 31, 2010 filed with the SEC on June 3, 2011).
10.4†*	Sublicense Agreement, between Inex Pharmaceuticals Corporation and Alnylam Pharmaceuticals, Inc., dated January 8, 2007 (incorporated herein by reference to Exhibit 4.3 to the Registrant's Amendment No. 1 to Form 20-F for the year ended December 31, 2010 filed with the SEC on January 31, 2012).
10.5†*	Settlement Agreement, between Sirna Therapeutics, Inc. and Merck & Co., Inc. and Protiva Biotherapeutics Inc. and Protiva Biotherapeutics (USA), Inc., effective as of October 9, 2007 (incorporated herein by reference to Exhibit 4.7 to the Registrant's Amendment No. 1 to Form 20-F for the year ended December 31, 2010 filed with the SEC on January 31, 2012).
10.6*#	Executive Employment Agreement with Mark Murray, dated May 30, 2008 (incorporated herein by reference to Exhibit 4.11 to the Registrant's Annual Report on Form 20-F for the year ended December 31, 2010 filed with the SEC on June 3, 2011).
10.7*#	Share Option Plan amended through May 12, 2009 (including form stock option agreements) (incorporated herein by reference to Exhibit 4.13 to the Registrant's Annual Report on Form 20-F for the year ended December 31, 2010 filed with the SEC on June 3, 2011).
10.8*	Lease Agreement with Canada Lands Company CLC Limited dated December 15, 1997, as amended (incorporated herein by reference to Exhibit 4.14 to the Registrant's Annual Report on Form 20-F for the year ended December 31, 2010 filed with the SEC on June 3, 2011).
10.9**#	Form of Indemnity Agreement (refiled herein with initial Agreement by reference to Exhibit 4.15 to the Registrant's Annual Report on Form 20-F for the year ended December 31, 2010 filed with the SEC on June 3, 2011).
10.10†*	License Agreement between the University of British Columbia and Inex Pharmaceuticals Corporation executed on July 30, 2001 (incorporated herein by reference to Exhibit 4.17 to the Registrant's Annual Report on Form 20-F for the year ended December 31, 2010 filed with the SEC on June 3, 2011).
10.11†*	Amendment Agreement between the University of British Columbia and Inex Pharmaceuticals Corporation dated July 11, 2006 (incorporated herein by reference to Exhibit 4.18 to the Registrant's Annual Report on Form 20-F for the year ended December 31, 2010 filed with the SEC on June 3, 2011).
10.12†*	Second Amendment Agreement between the University of British Columbia and Inex Pharmaceuticals Corporation dated January 8, 2007 (incorporated herein by reference to Exhibit 4.19 to the Registrant's Annual Report on Form 20-F for the year ended December 31, 2010 filed with the SEC on June 3, 2011).

10.13†*	Consent Agreement of the University of British Columbia to Inex/Alnylam Sublicense Agreement dated January 8, 2007 (incorporated herein by reference to Exhibit 4.20 to the Registrant's Annual Report on Form 20-F for the year ended December 31, 2010 filed with the SEC on June 3, 2011).
10.14*	Tekmira 2011 Omnibus Share Compensation Plan approved by shareholders on June 22, 2011 (incorporated herein by reference to Exhibit 4.25 to the Registrant's Annual Report on Form 20-F for the year ended December 31, 2011 filed with the SEC on March 27, 2012).
10.15†*	Settlement Agreement and General Release, by and among Tekmira Pharmaceuticals Corporation, Protiva Biotherapeutics Inc., Alnylam Pharmaceuticals, Inc., and AlCana Technologies, Inc., dated November 12, 2012 (incorporated herein by reference to Exhibit 4.26 to the Registrant's Annual Report on Form 20-F for the year ended December 31, 2012 filed with the SEC on March 27, 2013).
10.16†*	Cross-License Agreement by and among Alnylam Pharmaceuticals, Inc., Tekmira Pharmaceuticals Corporation and Protiva Biotherapeutics Inc., dated November 12, 2012 (incorporated herein by reference to Exhibit 4.27 to the Registrant's Annual Report on Form 20-F for the year ended December 31, 2012 filed with the SEC on March 27, 2013).
10.17*	Forms of Lock-Up Agreement (incorporated herein by reference to Exhibit 2.1 to the Registrant's Current Report on Form 8-K/A filed with the SEC on January 26, 2015).
10.18*	Form of Registration Rights Agreement (incorporated herein by reference to Exhibit 2.1 to the Registrant's Current Report on Form 8-K/A filed with the SEC on January 26, 2015).
10.19*	Form of Standstill Agreement (incorporated herein by reference to Exhibit 2.1 to the Registrant's Current Report on Form 8-K/A filed with the SEC on January 26, 2015).
10.20*	Form of Representation Letter (incorporated herein by reference to Exhibit 2.1 to the Registrant's Current Report on Form 8-K/A filed with the SEC on January 26, 2015).
10.21*	Executive Employment Agreement Elizabeth Howard, dated March 7, 2016 (incorporated herein by reference to Exhibit 10.78 to the Registrant's Annual Report on Form 10-K for the year ended December 31, 2015, filed with the SEC on March 9, 2016).
10.22†*	Services Agreement by and among Protiva Biotherapeutics Inc., Protiva Agricultural Development Company Inc. and Monsanto Company dated January 12, 2014 (incorporated herein by reference to Exhibit 10.32 to the Registrant's Annual Report on Form 10-K for the year ended December 31, 2013 filed with the SEC on March 28, 2014).
10.23*	Amended and Restated Option Agreement by and among Arbutus Biopharma Corporation, Protiva Biotherapeutics Inc., Protiva Agricultural Development Company Inc. and Monsanto Canada Inc., dated March 4, 2016 (incorporated herein by reference to Exhibit 10.79 to the Registrant's Annual Report on Form 10-K for the year ended December 31, 2015, filed with the SEC on March 9, 2016)
10.24*	Amended and Restated License and Services Agreement by and among Protiva Biotherapeutics Inc., Protiva Agricultural Development Company Inc. and Arbutus Biopharma Corporation, dated March 4, 2016 (incorporated herein by reference to Exhibit 10.80 to the Registrant's Annual Report on Form 10-K for the year ended December 31, 2015, filed with the SEC on March 9, 2016).
10.25*	First Amendment to the Protiva-Monsanto Services Agreement by and among Protiva Biotherapeutics Inc., Protiva Agricultural Development Company Inc. and Monsanto Company, dated March 4, 2016 (incorporated herein by reference to Exhibit 10.81 to the Registrant's Annual Report on Form 10-K for the year ended December 31, 2015, filed with the SEC on March 9, 2016).
10.26*#	Amending Agreement, dated as of November 2, 2015, among Arbutus Biopharma Corporation, Roivant Sciences Ltd., Patrick T. Higgins, Michael J. McElhaugh, Michael J. Sofia and Bryce A. Roberts (incorporated herein by reference to Exhibit 10.3 to the Registrant's Quarterly Report on Form 10-Q for the quarter ended September 30, 2015, filed with the SEC on November 5, 2015).
10.27*#	Renewal and Modification of Lease Agreement with Canada Lands Company CLC Limited dated December 15, 1997, as amended (incorporated herein by reference to Exhibit 10.2 to the Registrant's Quarterly Report on Form 10-Q for the quarter ended June 30, 2014, filed with the SEC on August 14, 2014).

10.28†*	Research Collaboration and Funding Agreement by and between Baruch S. Blumberg Institute and OnCore Biopharma, Inc., dated as of October 29, 2014 (incorporated herein by reference to Exhibit 10.1 to the Registrant's Quarterly Report on Form 10-Q for the quarter ended March 31, 2015, filed with the SEC on May 6, 2015).
10.29†*	Stock Purchase Agreement by and among OnCore Biopharma, Inc. and each of the stockholders of Enantigen Therapeutics, Inc., dated as of October 1, 2014 (incorporated herein by reference to Exhibit 10.1 to the Registrant's Quarterly Report on Form 10-Q for the quarter ended March 31, 2015, filed with the SEC on May 6, 2015).
10.30*#	Executive Employment Agreement, dated effective as of July 11, 2015, between OnCore Biopharma, Inc. and Michael J. Sofia (incorporated herein by reference to Exhibit 10.8 to the Registrant's Quarterly Report on Form 10-Q for the quarter ended June 30, 2015, filed with the SEC on August 7, 2015).
10.31*	Amended 2011 Omnibus Share Compensation Plan (incorporated herein by reference to Exhibit 10.1 to the Registrant's Quarterly Report on Form 10-Q for the quarter ended June 30, 2016, filed with the SEC on August 4, 2016).
10.32*	2016 Omnibus Share and Incentive Plan (incorporated herein by reference to Exhibit 10.2 to the Registrant's Quarterly Report on Form 10-Q for the quarter ended June 30, 2016, filed with the SEC on August 4, 2016).
10.33*	Amended and Restated Research Collaboration and Funding Agreement, between Arbutus Biopharma Inc. and the Baruch S. Blumberg Institute, dated June 6, 2016 (incorporated herein by reference to Exhibit 10.3 to the Registrant's Quarterly Report on Form 10-Q for the quarter ended June 30, 2016, filed with the SEC on August 4, 2016).
10.34*†	Lease Agreement between Arbutus Biopharma, Inc. and ARE-PA Region No. 7, LLC dated August 9, 2016 (incorporated herein by reference to Exhibit 10.1 to the Registrant's Quarterly Report on Form 10-Q for the quarter ended September 30, 2016, filed with the SEC on November 3, 2016).
10.35*†	First Amendment to Lease Agreement between Arbutus Biopharma, Inc. and ARE-PA Region No. 7, LLC dated October 7, 2016 (incorporated herein by reference to Exhibit 10.2 to the Registrant's Quarterly Report on Form 10-Q for the quarter ended September 30, 2016, filed with the SEC on November 3, 2016).
10.36*	Acknowledgment of Commencement Date in connection with Lease Agreement between Arbutus Biopharma, Inc. and ARE-PA Region No. 7, LLC dated August 9, 2016 and as amended on October, 7, 2016 (incorporated herein by reference to Exhibit 10.3 to the Registrant's Quarterly Report on Form 10-Q for the quarter ended September 30, 2016, filed with the SEC on November 3, 2016).
10.37*†#	License Agreement between Arbutus Biopharma Corporation and Alexion Pharma Holding dated March 15, 2017 (incorporated herein by reference to Exhibit 10.67 to the Registrant's Annual Report on Form 10-K for the year ended December 31, 2016, filed with SEC on March 22, 2017).
10.38*	Subscription Agreement and Related Documents between the Company and Roivant Sciences Ltd. (incorporated herein by reference to Exhibit A to the Registrant's Preliminary Proxy Soliciting Materials on Schedule Pre 14A for the Special Meeting, filed with the SEC on November 21, 2017).
10.39*	Governance Amendments between the Company and Roivant Sciences Ltd. (incorporated herein by reference to Exhibit B to the Registrant's Preliminary Proxy Soliciting Materials on Schedule Pre 14A for the Special Meeting, filed with the SEC on November 21, 2017).
10.40*	Amended and Restated Lockup Agreement between the Company and Roivant Sciences Ltd. (incorporated herein by reference to Exhibit D to the Registrant's Preliminary Proxy Soliciting Materials on Schedule Pre 14A for the Special Meeting, filed with the SEC on November 21, 2017).
10.41*	Amendment to Registration Rights Agreement between the Company and Roivant Sciences Ltd. (incorporated herein by reference to Exhibit E to the Registrant's Preliminary Proxy Soliciting Materials on Schedule Pre 14A for the Special Meeting, filed with the SEC on November 21, 2017).
10.42*	Amended and Restated Standstill Agreement between the Company and Roivant Sciences Ltd. (incorporated herein by reference to Exhibit F to the Registrant's Preliminary Proxy Soliciting Materials on Schedule Pre 14A for the Special Meeting, filed with the SEC on November 21, 2017).
10.43*#	Preferred Share Article Amendment between the Company and Roivant Sciences Ltd. (incorporated herein by reference to Exhibit G to the Registrant's Preliminary Proxy Soliciting Materials on Schedule Pre 14A for the Special Meeting, filed with the SEC on November 21, 2017).
10.44*#	Termination and Severance Agreement between Arbutus Biopharma Corporation and Bruce Cousins, dated February 8, 2018.

10.45*#	Executive Employment Agreement Transfer between Arbutus Biopharma Corporation and Koert VandenEnden., dated February 16, 2018.
10.46**	Exclusivity Agreement, dated February 13, 2018, by and between the Company and Roivant Sciences Ltd. (incorporated herein by reference to Exhibit 7.09 of the Schedule 13D filed with the SEC by Roivant Sciences Ltd. on February 14, 2018).
10.47*	Master Contribution And Share Subscription Agreement, by and between the Company, Genevant Sciences Ltd. and Roivant Sciences LTD. (incorporated herein by reference Exhibit 10.1 to the Registrant's Quarterly Report on Form 10-Q for the Quarter ended March 31, 2018 filed with the SEC on May 4, 2018).
10.50*	Open Market Sale AgreementSM, dated December 20, 2018, by and between Arbutus Biopharma Corporation and Jefferies LLC. (incorporated herein by reference to Exhibit 1.1 of the Current Report on Form 8-K filed with the SEC on December 20, 2018).
10.52**#	Executive Employment Agreement, dated June 11, 2018, by and between the Company and David Hasting
10.53**#	Executive Signing Bonus, dated May 28, 2018, by and between the Company and David Hasting
10.54*#	Executive Employment Agreement, dated October 8, 2018, by and between the Company and Gaston Picchio (incorporated by reference to Exhibit 10.1 to the Registrant's Quarterly Report on Form 10-Q for the Quarter ended September 30, 2018, filed with the SEC on November 7, 2018).
21.1**	List of Subsidiaries.
23.1**	Consent of KPMG LLP, an Independent Registered Public Accounting Firm.
31.1**	Certification of Chief Executive Officer pursuant to Rule 13a-14 or 15d-14 of the Securities Exchange Act of 1934, as adopted pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.
31.2**	Certification of Chief Financial Officer pursuant to Rule 13a-14 or 15d-14 of the Securities Exchange Act of 1934, as adopted pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.
32.1**	Certification of Chief 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 Chief Financial Officer pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.
101.INS**	XBRL Instance Document
101.SCH**	XBRL Taxonomy Extension Schema Document
101.CAL**	XBRL Taxonomy Extension Calculation Linkbase Document
101.DEF**	XBRL Taxonomy Extension Definition Linkbase Document
101.LAB**	XBRL Taxonomy Extension Label Linkbase Document
101.PRE**	XBRL Taxonomy Extension Presentation Linkbase Document

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* Previously filed

** Filed herewith

† Confidential treatment granted as to portions of this exhibit.

Management Contract

Financial Statements

See Index to Consolidated Financial Statements under Item 8 of Part II.

Financial Statement Schedules

None

Item 16.Form 10-K Summary

None

SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, the Registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized on March 7, 2019.

ARBUTUS BIOPHARMA CORPORATION

By: /s/ Mark Murray
Mark Murray
President and Chief Executive Officer

Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed below by the following persons on behalf of the Registrant and in the capacities indicated on March 7, 2019.

Signatures	Capacity in Which Signed
/s/ Frank Torti, M.D. Dr. Frank Torti, M.D.	Director (Chairman)
/s/ Mark Murray Mark Murray	President and Chief Executive Officer and Director (Principal Executive Officer)
/s/ David C. Hastings David C. Hastings	Chief Financial Officer (Principal Financial Officer)
/s/ Koert VandenEnden Koert VandenEnden	Chief Accounting Officer (Principal Accounting Officer)
/s/ Daniel Burgess Daniel Burgess	Director
/s/ Richard C. Henriques Richard C. Henriques	Director
/s/ Keith Manchester Keith Manchester	Director
/s/ Myrtle Potter Myrtle Potter	Director
/s/ James Meyers James Meyers	Director

INDEMNITY AGREEMENT

THIS AGREEMENT has been entered into as of the ____ day of _____, _____.

BETWEEN:

ARBUTUS BIOPHARMA CORPORATION, a company duly incorporated under the laws of the Province of British Columbia, and having an office at #100, 8900 Glenlyon Parkway, Burnaby, British Columbia, V5J 5J8

(the "**Indemnitor**")

AND:

_____, with an address of _____.

(the "**Indemnitee**")

WHEREAS:

(A) the Indemnitor has requested the Indemnitee to act as a director or officer of the Indemnitor and may ask the Indemnitee to act in a similar capacity with affiliates of the Indemnitor; and

(B) the Indemnitee has agreed, subject to the granting of the indemnities and releases herein provided for, to act as a director or officer of the Indemnitor and act in a similar capacity with affiliates of the Indemnitor if requested;

NOW THEREFORE in consideration of these premises, the mutual covenants and agreements herein contained and other good and valuable consideration, the receipt and sufficiency of which is acknowledged by each of the parties hereto, the parties hereto covenant and agree as set forth below.

1. INDEMNITY

1.1 Subject to §1.2, and §2.6(b) below the Indemnitor shall indemnify and save harmless the Indemnitee, and the Indemnitee's successors, heirs and personal representatives (together with the Indemnitee, the "Indemnified Parties") against and from:

(a) any and all actions and claims, whether current, threatened, pending or completed, whether civil, criminal, quasi-criminal or administrative, of every nature and kind whatsoever which may be brought or made by any person, firm, corporation or government, or by any governmental department, body, commission, board, bureau, agency or instrumentality against the Indemnified Parties in connection with the Indemnitee's execution of the duties of his office held as a director or officer with the Indemnitor or any affiliate of the Indemnitor from time to time;

(b) any and all costs, damages, charges, expenses (including legal fees and disbursements, on a full indemnity basis), fines, liabilities (statutory or otherwise), losses and penalties which the Indemnitee may sustain, incur or be liable for in consequence of his acting as a director or officer of the Indemnitor or any affiliate of the Indemnitor from time to time, whether sustained or incurred by reason of the Indemnitee's negligence, default, breach of duty, breach of trust, failure to exercise due diligence or otherwise in relation to the Indemnitor or any of its affiliates from time to time, or any of their respective affairs;

(c) without in any way limiting the generality of the foregoing, any and all costs, damages, charges, expenses (including legal fees and disbursements on a full indemnity basis), fines, liabilities, losses and penalties which the Indemnified Parties may sustain, incur or be liable for as a result of or arising by operation of statute and incurred by or imposed upon the Indemnified Parties in relation to the affairs of the Company in the Indemnitee's capacity as director or officer, including but not limited to, all statutory obligations to creditors, employees, suppliers, contractors, subcontractors and any government or agency or division of any government, whether federal, provincial, state, regional or municipal whether existing at the date hereof or incurred hereafter; and

(d) without in any way limiting the generality of the foregoing, the Indemnitor agrees that should any payment or reimbursement made pursuant to this Agreement, including without limitation the payment of insurance premiums or any payment made by an insurer under an insurance policy, be deemed to constitute a taxable benefit or otherwise be or become subject to any tax or levy upon the Indemnified Parties, then the Indemnitor shall pay such amount as may be necessary to ensure that the amount received by or on behalf of the Indemnified Parties, after the payment of or withholding for such tax, fully reimburses the Indemnified Parties for the actual cost, expense or liability incurred by or on his or her behalf.

1.2 Notwithstanding the provisions of §1.1, the Indemnitor shall not be obligated to indemnify or save harmless the Indemnified Parties against and from any action, claim, cost, damage, charge, expense, fine, liability, loss or penalty:

(a) if in respect thereof the Indemnitee failed to act honestly and in good faith with a view to the best interests of the Indemnitor or its affiliate as the case may be;

(b) in the case of a criminal or administrative action or proceeding, if the Indemnitee did not have reasonable grounds for believing that his conduct was lawful;

(c) arising out of any act, error or omission of the Indemnitee that is fraudulent or malicious and that is committed by the Indemnitee with actual fraudulent or malicious purpose or intent; or

(d) for which he is entitled to indemnity pursuant to any valid and collectible policy of insurance, to the extent of such insurance. Where partial indemnity is provided by such policy of insurance, the obligation of the Indemnitor under §1.1 shall continue in effect but be limited to that portion of the liability for which indemnity is not provided by such policy.

1.3 The determination of any claim by judgment, order, settlement or conviction, or upon a plea of "nolo contendere" or its equivalent, will not, of itself, create any presumption for the purposes of this Agreement that the Indemnitee did not act honestly and in good faith with a view to the best interests of the Indemnitor or with the care, diligence, and skill of a reasonably prudent person or, in the case of a criminal or administrative action or proceeding, that he or she did not have reasonable grounds for believing that his conduct was lawful (unless the judgment or order of a court specifically finds otherwise) or that the Indemnitee had committed wilful neglect or gross default.

2. DEFENSE

2.1 For the purposes of this section 2:

"**Action**" means any action, inquiry, investigation, suit or other proceeding before a court or other tribunal in which a Claim is brought, made or advanced by or against the Indemnitee;

"**Claim**" means any allegation of charge, claim, cost, damage, expense, fine, liability, loss or penalty contemplated by §1.1;

"**Judgment**" means an award of damages or other monetary compensation made in an Action or any amounts the Indemnitee is ordered to pay by any court or other tribunal or any government, governmental department, body, commission, board, bureau, agency or instrumentality having proper jurisdiction as a result of any Claim brought, made or advanced of or against the Indemnitee; and

"**Settlement**" means an agreement to compromise a Claim or an Action.

2.2 Upon the Indemnitee becoming aware of any pending or threatened Claim or Action, the Indemnitee must provide written notice of it to the Indemnitor as soon as is reasonably practicable.

2.3 The Indemnitor shall have full power and authority to conduct such investigation of each Claim as is reasonably necessary in the circumstances and shall pay all costs of such investigation.

2.4 Subject to this subsection and §2.6(b), the Indemnitor shall defend, on behalf of the Indemnitee, any Claim or Action, even if the basis for the Claim or Action is groundless, false or fraudulent. If the Indemnitor has reasonable grounds for believing that any of the circumstances described in §1.2 apply to the Claim or Action, then the Indemnitor, upon giving the Indemnitee written notice of its belief and the grounds therefore, may refuse to so defend the Claim or Action, but such refusal shall not relieve the Indemnitor from any of its obligations of indemnity hereunder if it has determined that none of the provisions of §1.2 apply to the Claim or Action.

2.5 The Indemnitor shall consult with and pay reasonable heed to the Indemnitee concerning the appointment of any defence counsel to be engaged by the Indemnitor in fulfillment of its obligation to defend a Claim or Action, pursuant to §2.4.

2.6 With respect to a Claim or Action for which the Indemnitor is obliged to indemnify the Indemnitee hereunder:

(a) the Indemnitor may conduct negotiations towards a Settlement and, with the written consent of the Indemnitee (which the Indemnitee agrees not to unreasonably withhold), the Indemnitor may make such Settlement as it (in its sole judgment) deems appropriate or expedient in the circumstances, provided, however, that the Indemnitee shall not be required, as part of any proposed Settlement, to admit liability or agree to indemnify the Indemnitor in respect of, or make contribution to, any compensation or other payment for which provision is made by such Settlement; and

(b) if the Indemnitee fails to give his consent to the terms of a proposed Settlement which is otherwise acceptable to the Indemnitor and the claimant, the Indemnitor may require the Indemnitee to negotiate or defend the Claim or Action independently of the Indemnitor and in such event any amount recovered by such claimant in excess of the amount for which Settlement could have been made by the Indemnitor, shall not be recoverable under this Indemnity, it being further agreed by the parties that the Indemnitor shall only be responsible for legal fees and costs up to the time at which such Settlement could have been made.

2.7 The Indemnitor shall have the right to negotiate a Settlement in respect of any Claim or Action which is founded upon any of the acts specified in §1.2. In the event that the Indemnitor negotiates a Settlement in respect of any of the acts specified in §1.2, the Indemnitee shall pay any compensation or other payment for which provision is made under the Settlement and shall not seek indemnity or contribution from the Indemnitor, within 60 days of the Indemnitor making demand therefor, all fees, costs and expenses (including legal fees and disbursements on a full indemnity basis) which result from the defence of the Claim or the Action in respect of which the Settlement was made, including the cost of any investigation undertaken by the Indemnitor in connection therewith, to the date the Settlement was made.

2.8 The Indemnitor shall pay any Judgment which may be given against the Indemnitee unless any of the circumstances set out in §1.2 applies to the Action in respect of which the Judgment is given or unless and to the extent the Indemnitee is otherwise entitled to indemnity under the policy of insurance as contemplated by §1.2(d) in either case, the Indemnitee shall pay to the Indemnitor, within 60 days of the Indemnitor making demand therefore, all, fees, costs and expenses (including legal fees and disbursements on a full indemnity basis) which result from the defence and appeal of the Action, including the costs of any investigation undertaken by the Indemnitor in connection with the Action.

2.9 Upon the request of the Indemnitee and subject to the restrictions set out in the *Business Corporations Act* (British Columbia), the Indemnitor shall pay the expenses of the Indemnitee incurred in relation to a Claim or an Action indemnified hereunder, provided the Indemnitee hereby gives an undertaking to repay such expenses if it is finally determined that such payments are not indemnifiable under this agreement or prohibited by the *Business Corporations Act* (British Columbia).

3. GENERAL

3.1 Nothing herein contained shall in any way affect the Indemnitee's right to resign from his position as director or officer of the Indemnitor at any time.

3.2 The indemnity and release herein provided for shall survive the termination of the Indemnitee's position as director or officer of the Indemnitor, the termination of this Agreement, and shall continue in full force and effect thereafter.

3.3 This Agreement supersedes all prior agreements between the parties with respect to its subject matter. Notwithstanding the forgoing, nothing in this Agreement shall be deemed to diminish or otherwise restrict an Indemnified Party's right to indemnification under any provision of the Indemnitor's articles or under applicable corporate law.

3.4 Unless stated otherwise, all monies to be paid hereunder shall be paid within 10 days of becoming payable.

3.5 The Indemnitee acknowledges that he or she has been advised to obtain independent legal advice with respect to entering into this Agreement, that he or she has obtained such independent legal advice or has expressly waived such advice, and that he or she is entering into this Agreement with full knowledge of the contents hereof, of his own free will and with full capacity and authority to do so.

3.6 If any provision of this Agreement is determined to be invalid or unenforceable in whole or in part, such invalidity or unenforceability shall attach only to such provision or part thereof and the remaining part of such provision and all other provisions hereof shall continue in full force and effect. The parties hereto agree to negotiate in good faith to agree to a substitute provision which shall be as close as possible to the intention of any invalid or unenforceable provision as may be valid or enforceable. The invalidity or unenforceability of any provision in any particular jurisdiction shall not affect its validity or enforceability in any other jurisdiction where it is valid or enforceable.

3.7 Each party hereto agrees to do all such things and take all such actions as may be necessary or desirable to give full force and effect to the matters contemplated by this Agreement.

3.8 This Agreement shall enure to the benefit of and be binding upon the parties hereto and their respective heirs, executors, administrators, legal representatives, successors and permitted assigns.

3.9 Time shall be of the essence of this Agreement.

3.10 This Agreement and the application or interpretation hereof shall be governed exclusively by its terms and by the laws of the Province of British Columbia and the laws of Canada applicable therein and the parties hereto hereby irrevocably attorn to the jurisdiction of the courts of the Province of British Columbia.

IN WITNESS WHEREOF parties hereto have duly executed this Agreement as of the date first written above.

ARBUTUS BIOPHARMA CORPORATION

Per: __
Authorized Signatory

Signed, Sealed and Delivered by _____ in the presence of:)

__)
Witness (Signature))

__)
Name (please print))

__)
Address)

__)
City, State/Province)

__)
Occupation)

__
Name of Indemnitee (please print)

Schedule to Exhibit 10.[ ]

The following directors and executive officers are parties to an Indemnity Agreement with the Company, each of which are substantially identical in all material respects to the representative Indemnity Agreement filed herewith as Exhibit 10.[ ] except as to the name of the signatory and the effective date of each signatory's Indemnity Agreement. The name of each signatory to the Indemnity Agreement is set forth below. The actual Indemnity Agreements are omitted pursuant to Instruction 2 to Item 601 of Regulation S-K.

INDEMNITEE

Mark J. Murray, PhD
David C. Hastings
Michael McElhaugh
Gaston Picchio, PhD
Frank Torti, MD
James Meyers
Myrtle Potter
Koert VandenEnden

EXECUTIVE EMPLOYMENT AGREEMENT

This Executive Employment Agreement ("**Agreement**") is made effective as of June 11, 2018 (the "**Effective Date**") by and between Arbutus Biopharma Inc. (the "**Company**"), and David Hastings (the "**Executive**") (together the "**Parties**").

RECITALS

A. WHEREAS, the Company desires to employ the Executive as Chief Financial Officer in accordance with the provisions of this Agreement; and

B. WHEREAS, Executive desires to serve the Company and accept employment under the terms and conditions stated in this Agreement; and

C. WHEREAS, the Parties have freely negotiated the terms and conditions of this Agreement and have reached agreement on them.

THEREFORE, the Parties agree as follows:

Section 1. Position and Duties. The Executive will serve as Chief Financial Officer of the Company, and will have powers and duties consistent with such position as may from time to time be prescribed by the Chief Executive Officer of the Company. As Chief Financial Officer of the Company, the Executive shall devote his full working time and efforts to the business and affairs of the Company. Notwithstanding the foregoing, the Executive may manage his personal investments or engage in charitable or other community activities and may engage in approved Board of Director appointments, except as restricted or prohibited by the terms of a confidentiality agreement between the Executive and the Company and as long as those engagements, services and activities, individually or in the aggregate, do not interfere with the Executive's performance of his duties to the Company.

Section 2. Compensation and Related Matters.

(a) Base Salary. The Executive's base salary will be US$400,000 per year. The Executive's base salary will be reviewed annually by the Chief Executive Officer of the Company and is subject to increase but not decrease except for an across-the-board salary reduction affecting all senior executives of the Company. The base salary in effect at any given time is referred to as "**Base Salary**" and this Agreement need not be modified to reflect a change in Base Salary. The Base Salary is subject to withholding and payable in a manner that is consistent with the Company's usual payroll practices for senior executives.

(b) Bonus. The Executive is eligible to be considered for an annual discretionary bonus of up to 40% of Base Salary (such bonus, the "**Target Bonus**"). The Target Bonus shall be subject to the terms of the bonus plan and the approval of the Company's Board of Directors (the "**Board**"), in its sole discretion, on an annual basis.

(c) Expenses. The Executive is entitled to receive prompt reimbursement for all reasonable expenses incurred by him in performing services under this Agreement, in

accordance with the policies and procedures then in effect and established by the Company for its senior executives.

(d) Other Benefits. The Executive is entitled to participate in or receive benefits consistent with other senior executives under the Company's employee benefit plans as they may be adopted and amended from time to time, subject to the terms and conditions of those employee benefit plans.

(e) Equity Compensation. Subject to the discretionary approval of the Company's Board of Directors, and in accordance with the Company's annual performance and compensation review process, the Executive shall be eligible to receive equity awards under the Arbutus Biopharma Corporation 2016 Omnibus Share and Incentive Plan and or any other similar equity incentive plan (the "**Equity Plan**") to the same extent as other executives of the Company. The Company's President and CEO will promptly recommend to the Board that the Executive receive an option grant in the amount of 200,000 shares of the Company, subject to the terms of the Equity Plan, the terms of a notice of grant and any other terms as may be required by the Board.

(f) Vacations. The Executive is entitled to paid vacation each year, in addition to sick leave and observed holidays in accordance with the policies and practices of the Company, as may be amended from time to time. Vacation may be taken at such times and intervals as the Executive shall determine, subject to the business needs of the Company. Vacation does not accrue and, accordingly, will not be paid out upon termination of employment.

Section 3. Non-Competition and Non-Solicitation

(a) The Executive acknowledges that the Company's industry is highly competitive and employees leaving the employ of the Company have the ability to cause significant damage to the Company's interests if they join a competing business immediately upon leaving the Company.

(b) Definitions:

(i) "Affiliate" means any person or entity directly or indirectly controlling, controlled by or under common control with the Company, where control may be by either management authority or equity interest.

(ii) "Business" or "Business of the Company" means (a) researching, developing, producing and marketing any treatment for hepatitis B virus infection in humans or (b) any other treatment area in which the Company has an active research and development program on the date this Agreement terminates and in connection with which the Executive directly provided service or had direct supervisory responsibilities.

(iii) "Competing Business" means any endeavor, activity or business which is competitive in any material way with the Business of the Company worldwide.

(iv) "Contact" means any person, firm, corporation or other entity that was a client, customer, supplier, principal, shareholder, investor, collaborator, strategic partner,

licensee, contact or prospect of the Company (or of its partners, funders or Affiliates) with whom the Executive dealt or otherwise became aware of during the term of his employment in any capacity with the Company.

(v) "Restricted Period" means: (a) with respect to Section 3(d) the eighteen (18) month period commencing immediately after the Executive's employment terminates and (b) with respect to Section 3(f), the twelve (12) month period commencing immediately after the Executive's employment terminates.

(c) Reasonableness. The Executive hereby acknowledges and agrees that:

(i) both before and since the Effective Date the Company has operated and competed and will operate and compete worldwide, with respect to the Business of the Company;

worldwide;

(ii) competitors of the Company and the Business are located

(iii) in order to protect the Company adequately, any enjoinder of

competition would have to apply to any country in which the Company, during the term of the Executive's employment, had material business relationships;

(iv) during the course of the Executive's employment with the Company, on behalf of the Company, the Executive will acquire knowledge of, and will come into contact with, initiate and establish relationships with, both existing and new clients, customers, suppliers, principals, contacts and prospects of the Company, and that in some circumstances the Executive may become the senior or sole representative of the Company dealing with such persons; and

(v) in light of the foregoing, the provisions of this Section 3 are reasonable and necessary for the proper protection of the Business of the Company.

(d) Restrictive Covenant. Except as set forth on Exhibit B attached hereto, during the term of the Executive's employment and for the Restricted Period after the termination thereof, the Executive shall not, without the advance written consent of the Board, such consent to be granted or withheld in the Board's sole discretion, within the geographic scope of any country in which the Company, during the term of the Executive's employment, had material business relationships, carry on or be employed by or engaged in or have any financial or other interest in or be otherwise commercially involved in a Competing Business, directly or indirectly, either individually or in partnership or jointly or in conjunction with any person, firm, corporation or other entity, as principal, agent, consultant, advisor, employee, shareholder or in any manner whatsoever.

(e) Exception. The Executive shall not be in default of Section 3(d) by virtue of the Executive:

(i) following the termination of employment, holding, strictly for portfolio purposes and as a passive investor, no more than five percent (5%) of the issued and outstanding shares of, or any other interest in, any corporation or other entity that is a Competing Business; or

(ii) during the term of his employment, holding, strictly for portfolio purposes and as a passive investor, issued and outstanding shares of, or any other interest in, any corporation or other entity, the business of which corporation or other entity is in the same Business as the Company provided such corporation is not a Competing Business, and provided further that the Executive first obtains the Company's written consent, which consent will not be unreasonably withheld.

If the Executive holds issued and outstanding shares or any other interest in a corporation or other entity pursuant to Section 3(e)(ii) above, and following the acquisition of such shares or other interest the business of the corporation or other entity becomes a Competing Business, the Executive will promptly dispose of the Executive's shares or other interest in such corporation or other entity.

(f) Non-Solicitation. The Executive shall not, during the term of his employment and for the Restricted Period after the termination thereof for any reason, whether legal or illegal, either individually or in partnership or jointly or in conjunction with any person, firm, corporation or other entity, as principal, agent, consultant, advisor, employee, shareholder or in any manner whatsoever, without the prior written and informed consent of the Company, directly or indirectly:

(i) solicit, induce or encourage any Contact to curtail or cease its relationship with the Company, for any purpose which is competitive with the Business; or

(ii) accept (or procure or assist the acceptance of) any business from any Contact if such business is competitive with the Business; or

(iii) be employed by or supply (or procure or assist the supply of) any goods or services to any Contact for any purpose which the Executive knows or has reason to know is competitive with the Business; or

(iv) employ, engage, offer employment or engagement to or solicit the employment or engagement of or otherwise entice away from or solicit, induce or encourage to leave the employment or engagement of the Company, any individual who is employed or engaged by the Company at the time of any such offer, solicitation or enticement whether or not such individual would commit any breach of his contract or terms of employment or engagement by leaving the employ or the engagement of the Company, provided that the Executive shall be permitted, solely in a personal capacity, to provide letters of reference for individuals who are employed by the Company.

(g) Validity. The Executive expressly recognizes and acknowledges that it is the intent of the parties that the Executive's activities following the termination of the Executive's employment with the Company be restricted in the manner described in this Section 3, and acknowledges that good, valuable, and sufficient consideration has been provided in

exchange for such restrictions. The Executive agrees that should any of the restrictions contained in this Section 3 be found to be unreasonable to any extent by a court of competent jurisdiction adjudicating upon the validity of the restriction, whether as to the scope of the restriction, the area of the restriction or the duration of the restriction, then such restriction shall be reduced to that which is in fact declared reasonable by such court, or a subsequent court of competent jurisdiction, requested to make such a declaration, in order to ensure that the intention of the parties is given the greatest possible effect.

Section 4. Termination. The Executive's employment by the Company may be terminated without any breach of this Agreement under the following circumstances:

(a) Death. The Executive's employment hereunder terminates upon his death.

(b) Disability. The Company may terminate the Executive's employment if he is disabled (as determined by the Chief Executive Officer) in a manner that renders the Executive unable to perform the essential functions of his then existing position or positions under this Agreement with or without reasonable accommodation for a period of six months or more. Nothing in this Section 4(b) is to be construed to waive the Executive's rights, if any, under existing law including, without limitation, the Family and Medical Leave Act of 1993, 29 U.S.C. §2601 et seq., and the Americans with Disabilities Act, 42 U.S.C. §12101 et seq.

(c) Termination by Company for Cause. For purposes of this Agreement, "For Cause" shall mean: (i) Employee is charged with a felony (excluding a DUI) or any violation of state or federal securities laws; (ii) Employee willfully engages in conduct that is in bad faith and materially injurious to the Company, including but not limited to, misappropriation of trade secrets, fraud or embezzlement; (iii) Employee commits a material breach of this Agreement; (iv) Employee willfully refuses to implement or follow a lawful policy or directive of the Company; or (v) Employee engages in misfeasance or malfeasance demonstrated by a pattern of failure to perform job duties diligently and professionally. The Company may terminate Employee's employment For Cause at any time, without any advance notice. The Company shall pay Employee all compensation to which Employee is entitled up through the date of termination, subject to any other rights or remedies of the Company under law; and thereafter all obligations of the Company under this Agreement shall cease.

(d) Termination by the Company Without Cause or by the Executive for Good Reason. The Company may terminate the Executive's employment under this Agreement at any time without Cause and the Executive may terminate his employment with Good Reason. For purposes of this Agreement, "Good Reason" means the occurrence of any of the following events without the Executive's prior written consent: (i) the failure of the Executive to be appointed to the position set forth in Section 1, if not promptly cured after written notice; (ii) a reduction by the Company of the Executive's Base Salary or Target Bonus percentage, except for an across-the-board salary reduction affecting all senior executives of the Company; (iii) a relocation of Employee's principal place of employment by more than fifty (50) miles; (iv) a termination of the Executive's employment by the Company; and (v) a substantial and adverse change to the Executive's duties and responsibilities. For purposes of this Agreement, except for the Company terminating the Executive's employment, termination for Good Reason requires

Executive to comply with the "Good Reason Process," which means that (i) the Executive reasonably determines in good faith that a Good Reason condition has occurred; (ii) the Executive notifies the Company in writing of the first occurrence of the Good Reason condition

within 30 days of the first occurrence of such condition; (iii) the Executive cooperates in good faith with the Company's efforts, for a period of not less than 30 days following that notice (the "**Cure Period**") to remedy the condition; (iv) notwithstanding the Company's efforts, the Good Reason condition continues to exist; and (v) the Executive terminates his employment within 30 days after the end of the Cure Period. If the Company cures the Good Reason condition during the Cure Period, Good Reason is deemed not to have occurred.

Any termination by the Company of the Executive's employment under this Agreement that does not constitute a termination for Cause under Section 4(c) and does not result from the death or disability of the Executive under Section 4(a) or (b) is a termination without Cause.

(e) Termination by the Executive. Executive may terminate employment with the Company without Good Reason at any time for any reason or no reason at all, upon thirty (30) days' advance written notice. The Company shall have the option, in its sole discretion, to make Executive's termination effective or to direct the Executive to perform no work and/or remain off premises at any time prior to the end of such notice period as long as the Company pays Executive all compensation to which Executive is entitled up through the last day of the 30 day notice period.

(f) Notice of Termination. Except for termination as specified in Section 4(a), any termination of the Executive's employment by the Company or any termination of his employment by the Executive must be communicated by written Notice of Termination to the other party. For purposes of this Agreement, a "**Notice of Termination**" means a notice that indicates the specific termination provision in this Agreement that the termination is based upon.

(g) Date of Termination. "**Date of Termination**" means: (i) if the Executive's employment is terminated by his death, the date of his death; (ii) if the Executive's employment is terminated on account of disability under Section 4(b) or by the Company for Cause under Section 4(c), or by the Company without Cause under Section 4(d), on the date the Notice of Termination is given; (iii) if the Executive terminates his employment under Section 4(e) without Good Reason, on the date specified by the Executive in the notice (which shall be at least thirty (30) days after the date of the Notice of Termination) and, if no such date is specified, 30 days after the date of the Notice of Termination; and (iv) if the Executive terminates his employment under Section 4(e) with Good Reason, the date on which a Notice of Termination is given after the end of the Cure Period. Notwithstanding the foregoing, if the Executive gives a Notice of Termination to the Company that takes effect at a future date, the Company may unilaterally accelerate the Date of Termination and that acceleration will not be deemed a termination by the Company for purposes of this Agreement.

Section 5. Compensation Upon Termination.

(a) Termination Generally. If the Executive's employment with the Company is terminated for any reason, the Company shall pay or provide to the Executive (or to his authorized representative or estate), (i) unpaid expense reimbursements submitted to the Company in accordance with the Company's policies; (ii) accrued but unused vacation to the

extent payment is required by law or Company policy; (iii) any vested benefits the Executive may have under any employee benefit plan of the Company; (iv) any earned but unpaid Base

Salary and (v) any earned but unpaid annual Target Bonus, for the prior fiscal year (collectively the "**Accrued Benefit**") on or before the time required by law, but in no event more than 30 days after the Executive's Date of Termination. The Executive shall not be entitled to any other salary, compensation, bonus (or pro rata share thereof) or benefits from the Company thereafter, except as otherwise specifically provided hereunder, under the Company's employee benefit plans or as expressly required by applicable law.

(b) Termination by the Company Without Cause or by the Executive for Good Reason. If the Executive's employment is terminated by the Company without Cause or by the Executive for Good Reason, then the Company shall pay the Executive his Accrued Benefit as of the Date of Termination. In addition, subject to the Executive providing the Company with a fully effective general release of claims in a form and manner satisfactory to the Company that
includes but is not limited to the terms set forth in the attached Exhibit A (the "**Release**") within the 60-day period following the Date of Termination, the Company shall pay the Executive (i) severance pay in a lump sum in cash in an amount equal to eighteen (18) months of Executive's Base Salary, less lawful withholding (as applicable, "**Severance Amount**"), payable within 60 days after the Date of Termination, but if that 60-day period extends over two calendar years, the Company shall make the payment in the second calendar year, (ii) a bonus payment equal to the lesser of (y) Target Bonus pro-rated for the portion of the year the Executive was employed by the Company prior to the termination or (z) the average of the bonus payments, if any, made to the Executive with respect to the previous three (3) calendar years preceding the date of termination of employment, pro-rated for the portion of the year that Executive is employed, (iii) provided that the Executive timely elects COBRA coverage, reimburse the Executive for the COBRA premiums paid by the Executive, if any, for the continuation of coverage under the Executive's then-existing group company health plan that the Executive and his dependents are eligible to receive for the earlier of a period of up to eighteen (18) months from the date of the Executive's termination of employment, or until the Executive becomes eligible to receive health insurance benefits under any other employer's group health plan, and (iv) immediate vesting on a pro-rata basis of the Executive's initial stock option grant, prorated at 1/36th of the total option grant for each completed month of service as at the Date of Termination.

Section 6. Change in Control Provisions. The provisions of this Section 6 set forth the Executive's rights and obligations upon the occurrence of a Change in Control of the Company. These provisions are intended to assure and encourage in advance the Executive's
continued attention and dedication to his assigned duties and his objectivity during the pendency and after the occurrence of any Change in Control. The provisions of this Section 6 apply in addition to, and/or modify, the provisions of Section 5(b) regarding severance pay and benefits upon a termination of employment, if applicable, if the termination of employment occurs within 12 months after the occurrence of a Change in Control. These provisions are subject to the Executive providing (and not revoking) the Company with a fully effective Release. These provisions terminate and are of no further force or effect beginning 12 months after the occurrence of such a Change in Control.

(a) Severance. If within 12 months following a Change of Control (i) the Company terminates the Executive's employment with the Company other than for Cause, or (ii)

the Executive resigns from his employment with the Company for Good Reason, within the 60- day period following the Date of Termination, then, in lieu of paying the Executive the

Severance Amount and in addition to paying the Accrued Benefit, Company shall: (i) pay the Executive severance pay in a lump sum in cash (less applicable withholdings) in an amount equal to the Executive's Base Salary multiplied by 2.0 ("**Change in Control Severance Amount**"), payable within 60 days after the Date of Termination, but if that 60-day period extends over two calendar years, the Company shall make the payment in the second calendar year; (ii) pay the Executive a bonus payment equal to the Target Bonus pro-rated for that portion of the year that Executive is employed, (iii) provided that the Executive timely elects COBRA coverage, reimburse the Executive for the COBRA premiums paid by the Executive, if any, for the continuation of coverage under the Executive's then-existing group company health plan that the Executive and his dependents are eligible to receive for the earlier of (x) a period of up to 18 months from the date of the Executive's termination of employment, or (y) until the Executive becomes eligible to receive health insurance benefits under any other employer's group health plan; and (iv) cause all stock options and other stock-based awards granted on or after the Effective Date and held by the Executive to immediately accelerate, vest, and become fully exercisable or nonforfeitable.

(b) Additional Limitation.

(i) Anything in this Agreement to the contrary notwithstanding, if the amount of any compensation, payment, acceleration, benefit, or distribution by the Company to or for the benefit of the Executive, whether paid or payable or distributed or distributable pursuant to the terms of this Agreement or otherwise, calculated in a manner consistent with Section 280G of the Internal Revenue Code of 1986, as amended (the "**Code**") and the applicable regulations thereunder (the "**Severance Payments**"), would be subject to the excise tax imposed by Section 4999 of the Code, then the Severance Payments will be reduced (but not below zero) to the extent necessary so that the sum of all Severance Payments does not exceed the Threshold Amount (defined below), but if the after-tax amount the Executive would receive if there were no reduction pursuant to this section (including any federal, state, and local taxes) exceeds the after-tax amount the Executive would receive if the Severance Payments were reduced below the Threshold Amount, the Severance Payments will no longer be so reduced. If Severance Payments are required to be reduced, the Severance Payments will be reduced in the following order: (1) cash payments not subject to Section 409A of the Code; (2) cash payments subject to Section 409A of the Code; (3) equity-based payments and acceleration; and (4) non- cash forms of benefits.

(ii) For the purposes of this Section 6(c), "**Threshold Amount**" means three times the Executive's "base amount" within the meaning of Section 280G(b)(3) of the Code and the regulations promulgated thereunder less one dollar ($1.00).

(iii) The determinations under this Section 6(c) will be made by a nationally recognized accounting firm selected by the Company (the "**Accounting Firm**"), which must provide detailed supporting calculations both to the Company and the Executive within 15 business days of the Date of Termination, if applicable, or at such earlier time as is reasonably requested by the Company or the Executive.

(c) Change in Control Definition. For purposes of this Section 6, "**Change in Control**" means the consummation of any of the following:

(i) the sale of all or substantially all of the assets of the Company or the Parent to an unrelated person or entity;

(ii) a merger, reorganization, or consolidation involving the Company or the Parent in which the shares of voting stock outstanding immediately prior to the transaction represent or are converted into or exchanged for securities of the surviving or resulting entity that, immediately upon completion of the transaction, represent less than 50% of the outstanding voting power of the surviving or resulting entity;

(iii) the acquisition of all or a majority of the outstanding voting stock of the Company or the Parent in a single transaction or a series of related transactions by a person or group of persons; or

(iv) any other acquisition of the business of the Company or the Parent, as determined by the Board;

but the Company's initial public offering, any subsequent public offering, or another capital raising event, or a merger effected solely to change the Company's domicile does not constitute a Change in Control.

Section 7. Section 409A Compliance. The following rules shall apply, to the extent necessary, with respect to distribution of the payments and benefits, if any, to be provided to the Executive under this Agreement. Subject to the provisions in this Section, the severance payments pursuant to this Agreement shall begin only upon the date of the Executive's "separation from service" (determined as set forth below) which occurs on or after the date of the Executive's termination of employment.

(a) This Agreement is intended to comply with Code Section 409A (to the extent applicable) and the parties hereto agree to interpret, apply and administer this Agreement in the least restrictive manner necessary to comply therewith and without resulting in any increase in the amounts owed hereunder by the Company.

(b) It is intended that each installment of the severance payments and benefits provided under this Agreement shall be treated as a separate "payment" for purposes of Section 409 A of the Internal Revenue Code of 1986, as amended, and the guidance issued thereunder ("Section 409A"). Neither the Executive nor the Company shall have the right to accelerate or defer the delivery of any such payments or benefits except to the extent specifically permitted or required by Section 409A.

(c) If, as of the date of the Executive's "separation from service" from the Company, the Executive is not a "specified employee" (within the meaning of Section 409 A), then each installment of the severance payments and benefits shall be made on the dates and terms set forth in this Agreement.

(d) If, as of the date of the Executive's “separation from service” from the Company, the Executive is a “specified employee” (within the meaning of Section 409A), then:

(i) Each installment of the severance payments and benefits due under this Agreement that, in accordance with the dates and terms set forth herein, will in all circumstances, regardless of when the separation from service occurs, be paid within the short- term deferral period (as defined in Section 409A) shall be treated as a short-term deferral within the meaning of Treasury Regulation Section 1.409A-l(b)(4) to the maximum extent permissible under Section 409A; and

(ii) Each installment of the severance payments and benefits due under this Agreement that is not described in Section 7(d)(i) above and that would, absent this subsection, be paid within the six-month period following the Executive's “separation from service” from the Company shall not be paid until the date that is six months and one day after such separation from service (or, if earlier, the Executive's death), with any such installments that are required to be delayed being accumulated during the six-month period and paid in a lump sum on the date that is six months and one day following the Executive's separation from service and any subsequent installments, if any, being paid in accordance with the dates and terms set forth herein; provided, however, that the preceding provisions of this sentence shall not apply to any installment of severance payments and benefits if and to the maximum extent that such installment is deemed to be paid under a separation pay plan that does not provide for a deferral of compensation by reason of the application of Treasury Regulation 1.409A-1 (b)(9)(iii) (relating to separation pay upon an involuntary separation from service). Any installments that qualify for the exception under Treasury Regulation Section 1.409A-l(b)(9)(iii) must be paid no later than the last day of the second taxable year following the taxable year in which the separation from service occurs.

(e) The determination of whether and when the Executive's separation from service from the Company has occurred shall be made in a manner consistent with, and based on the presumptions set forth in, Treasury Regulation Section 1.409A-l(h). Solely for purposes of this Section, “Company” shall include all persons with whom the Company would be considered a single employer as determined under Treasury Regulation Section 1.409A-l(h)(3).

(f) All reimbursements and in-kind benefits provided under this Agreement shall be made or provided in accordance with the requirements of Section 409A to the extent that such reimbursements or in-kind benefits are subject to Section 409A, including, where applicable, the requirements that (i) any reimbursement is for expenses incurred during the Executive's lifetime (or during a shorter period of time specified in this Agreement), (ii) the amount of expenses eligible for reimbursement during a calendar year may not affect the expenses eligible for reimbursement in any other calendar year, (iii) the reimbursement of an eligible expense will be made on or before the last day of the calendar year following the year in which the expense is incurred and (iv) the right to reimbursement is not subject to set off or liquidation or exchange for any other benefit.

(g) Notwithstanding anything herein to the contrary, the Company shall have no liability to the Executive or to any other person if the payments and benefits provided in this

Agreement that are intended to be exempt from or compliant with Section 409A are not so exempt or compliant.

Section 8. Confidential Information. Employee agrees to enter into the Company's standard Employee Confidentiality and Proprietary Rights Agreement (the "Confidential Information Agreement"). Employee's receipt of any benefits in connection with or following Employee's termination will be subject to Employee continuing to comply with the terms of Confidential Information Agreement.

Section 9. Cooperation; Other Documents; Non-Disclosure.

(a) Litigation and Regulatory Cooperation. During and after the Executive's employment, the Executive shall reasonably cooperate with the Company in the defense or prosecution of any claims or actions now in existence or which may be brought in the future against or on behalf of the Company which relate to events or occurrences that took place while the Executive was employed by the Company. The Executive's reasonable cooperation in connection with such claims or actions includes, but is not limited to, being available to meet with counsel to prepare for discovery or trial and to act as a witness on behalf of the Company at mutually convenient times. During and after the Executive's employment, the Executive also shall reasonably cooperate with the Company in connection with any investigation or review of any federal, state, or local regulatory authority as any such investigation or review relates to events or occurrences that took place while the Executive was employed by the Company. The Company shall reasonably compensate Executive, in its sole discretion, for his time spent, and reimburse the Executive for any reasonable out-of-pocket expenses incurred, in connection with the Executive's performance of obligations pursuant to this Section 9(a).Non-Disclosure. The Executive shall use his reasonable efforts to maintain the confidentiality of the terms of this Agreement to the extent permitted by law, but the Executive may disclose the terms of this Agreement to the extent it is concerted activity under Section 7 of the National Labor Relations Act and to his immediate family members and to his legal, tax, and other advisors.

Section 10. Arbitration of Disputes.

(b) Scope of Arbitration Requirement. The Executive hereby waives his right to a trial before a judge or jury and agrees to arbitrate before a neutral arbitrator skilled in hearing similar disputes any and all claims or disputes arising out of this Agreement and any and all claims arising from or relating to his employment, including but not limited to claims against any current or former employee, director, or agent of the Company, claims of wrongful termination, retaliation, discrimination, harassment, breach of contract (including but not limited to disputes pertaining to the formation, validity, interpretation or effect of this Agreement), breach of the covenant of good faith and fair dealing, defamation, invasion of privacy, fraud, misrepresentation, constructive discharge or failure to provide a leave of absence, or claims regarding commissions, stock options or bonuses, infliction of emotional distress, or unfair business practices (each an "**Arbitrable Dispute**"). Arbitration is the exclusive remedy for any Arbitrable Dispute, instead of any court or administrative action, unless the waiver of a certain court or administrative action is prohibited by law. Except as otherwise required under applicable law, the Executive hereby waives any right to assert an Arbitrable Dispute as a class action or

representative action claim against the Company and agrees to only submit the Executive's own, individual claims in arbitration and will not seek to represent the interests of any other person.

(c) Procedure. Any arbitration will be administered by the American Arbitration Association ("**AAA**") and the neutral arbitrator will be selected in a manner consistent with AAA's National Rules For The Resolution of Employment Disputes ("**Applicable Arbitration Rules**"). Any arbitration under this Agreement must be conducted in the Commonwealth of Pennsylvania, and the arbitrator must administer and conduct the
arbitration in accordance with the Applicable Arbitration Rules, except that (i) the arbitrator must allow for the discovery authorized by the Pennsylvania Rules of Civil Procedure or the discovery that the arbitrator decides is necessary for the Parties to vindicate their respective claims or defenses, and (ii) presentation of evidence will be governed by the Pennsylvania Rules of Evidence. Within a reasonable time after the conclusion the arbitration proceedings, the arbitrator shall issue a written decision and must include the findings of fact and law that support that decision. The arbitrator has the power to award any remedies available under applicable law, and the arbitrator's decision is final and binding on both Parties, except to the extent applicable law allows for judicial review of arbitration awards.

(d) Costs. The Company shall bear all the costs of arbitration, except that the Executive shall pay the first $125.00 of any filing fees associated with any arbitration the Executive initiates. Both Parties are responsible for their own attorneys' fees, and the arbitrator may not award attorneys' fees unless a statute or contract at issue specifically authorizes such an award.

(e) Applicability. This Section 10, does not apply to (i) workers' compensation or unemployment insurance claims or (ii) claims concerning ownership, validity, infringement, misappropriation, disclosure, misuse, or enforceability of any confidential information, patent right, copyright, mask work, trademark, or any other trade secret or intellectual property held or sought by either the Executive or the Company.

(f) Remedy. Should any party institute any legal action or administrative proceeding against the other with respect to any claim waived by this Agreement or pursue any Arbitrable Dispute by any method other than as set forth above, except to enforce the arbitration provisions and as expressly provided for in this Section 9, the responding party is entitled to recover from the initiating party all damages, costs, expenses, and attorneys' fees incurred as a result of that action.

Section 11. Consent to Jurisdiction. To the extent that any court action is initiated to enforce Section 10 of this Agreement, the Parties hereby consent to the jurisdiction of any state court in the Commonwealth of Pennsylvania and any U.S. District Court sitting in the Commonwealth of Pennsylvania. Accordingly, with respect to any such court action, the Executive (a) submits to the personal jurisdiction of such courts; (b) consents to service of process; and (c) waives any other requirement (whether imposed by statute, rule of court, or otherwise) with respect to personal jurisdiction or service of process.

Section 12. Integration. This Agreement, together with the Confidential Information Agreement executed concurrently herewith, constitute the entire agreement between the Parties

with respect to the subject matter hereof and supersedes all prior agreements between the Parties concerning such subject matter. Without limiting the foregoing, the parties agree that any employment agreement, other than this Agreement, existing between the Parties as of the date hereof is hereby terminated and shall be of no force of effect.

Section 13. Withholding. All payments made by the Company to the Executive under this Agreement will be net of any tax or other amounts lawfully withheld by the Company under applicable law. Nothing in this Agreement is to be construed to obligate the Company to design or implement any compensation arrangement in a way that minimizes tax consequences for the Executive.

Section 14. Successor to the Executive. This Agreement inures to the benefit of and is enforceable by the Executive's personal representatives, executors, administrators, heirs, distributees, devisees, and legatees. If the Executive dies after his termination of employment but prior to the completion by the Company of all payments due him under this Agreement, the Company shall continue the payments to the Executive's beneficiary designated in writing to the Company prior to his death (or to his estate, if the Executive fails to make such a designation).

Section 15. Enforceability. If any portion or provision of this Agreement is declared illegal or unenforceable by a court of competent jurisdiction, then the remainder of this Agreement, or the application of that portion or provision in circumstances other than those as to which it is so declared illegal or unenforceable, will not be affected by that declaration, and each portion and provision of this Agreement will continue to be valid and enforceable to the fullest extent permitted by law.

Section 16. Survival. The provisions of this Agreement survive the termination of this Agreement and/or the termination of the Executive's employment to the extent necessary to effectuate the intent of the Parties as expressed in this Agreement.

Section 17. Waiver. No waiver of any provision of this Agreement is effective unless made in writing and signed by the waiving party, and, in the case of the Company only after the waiver has been specifically approved by the Board. The failure of either party to require the performance of any term or obligation of this Agreement, or the waiver by either party of any breach of this Agreement, will not prevent any subsequent enforcement of such term or obligation or be deemed a waiver of any subsequent breach.

Section 18. Notices. Any notices, requests, demands, and other communications provided for by this Agreement are sufficient if in writing and delivered in person or sent by a nationally recognized overnight courier service or by registered or certified mail, postage prepaid, return receipt requested, to the Executive at the last address the Executive has filed in writing with the Company or, in the case of the Company, at its main offices, attention to the Corporate Secretary.

Section 19. Amendment. This Agreement may be amended or modified only by a written instrument signed by the Executive and by a duly authorized representative of the Company.

Section 20. Governing Law. This is a Pennsylvania contract and is to be construed under and be governed in all respects by the laws of the Commonwealth of Pennsylvania without giving effect to the conflict of laws principles of that state.

Section 21. Counterparts. This Agreement may be executed in any number of counterparts, and by each party on separate counterparts, each of which counterparts, when so executed and delivered is to be taken to be an original; but those counterparts together constitute one and the same document. PDF, facsimile, scanned, and electronic signatures have the same legal effect as original ink signatures.

Section 22. Successor to Company. The Company shall require any successor (whether direct or indirect, by purchase, merger, consolidation, or otherwise) to all or substantially all of the business or assets of the Company expressly to assume and agree to perform this Agreement to the same extent that the Company would be required to perform it if no succession had taken place. Failure of the Company to obtain an assumption of this Agreement at or prior to the effectiveness of any succession is a material breach of this Agreement.

Section 23. Voluntary Nature of Agreement. The Executive acknowledges and agrees that he is executing this Agreement voluntarily and without any duress or undue influence by the Company or anyone else. The Executive further acknowledges and agrees that he has carefully read this Agreement and that he has asked any questions needed for him to fully understand the terms, consequences, and binding effect of this Agreement. The Executive agrees that he has been provided an opportunity to seek the advice of an attorney of his choice before signing this Agreement.

[Signature Page Follows]

The Parties are executing this Executive Agreement as of the date set forth in the introductory paragraph.

[Signature Page intentionally omitted to Executive Employment Agreement]

EXHIBIT A

GENERAL RELEASE LANGUAGE

The Executive agrees, for himself, his spouse, heirs, executor or administrator, assigns, insurers, attorneys, and other persons or entities acting or purporting to act on his behalf (the "**Executive's Parties**"), to irrevocably and unconditionally release, acquit, and forever discharge the Company, its affiliates, subsidiaries, directors, officers, employees, shareholders, partners, agents, representatives, predecessors, successors, assigns, insurers, attorneys, benefit plans sponsored by the Company, and said plans' fiduciaries, agents and trustees (the "**Company's Parties**"), from any and all actions, causes of action, suits, claims, obligations, liabilities, debts, demands, contentions, damages, judgments, levies, and executions of any kind, whether in law or in equity, known or unknown, which the Executive's Parties have, have had, or may in the future claim to have against the Company's Parties by reason of, arising out of, related to, or resulting from the Executive's employment with the Company or the termination of that employment.

This release specifically includes without limitation any claims arising in tort or contract, any claim based on wrongful discharge, any claim based on breach of contract, any claim arising under federal, state or local law prohibiting race, sex, age, religion, national origin, handicap, disability, or other forms of discrimination, any claim arising under federal, state, or local law concerning employment practices, and any claim relating to compensation or benefits. This specifically includes, without limitation, any claim that the Executive has or has had under Title VII of the Civil Rights Act of 1964, as amended, the Age Discrimination in Employment Act, as amended, the Americans with Disabilities Act, as amended, and the Employee Retirement Income Security Act of 1974, as amended. It is understood and agreed that the waiver of benefits and claims contained in this section does not include a waiver of the right to payment of any vested, nonforfeitable benefits to which the Executive or a beneficiary of the Executive may be entitled under the terms and provisions of any employee benefit plan of the company which have accrued as of the Date of Termination, and does not include a waiver of the right to benefits and payment of consideration to which the Executive may be entitled under this Agreement or any of the agreements contemplated by this Agreement (including the indemnification agreement and the stock option agreement). The Executive acknowledges that he is entitled to only the severance benefits and compensation set forth in this Agreement, and that all other claims for any other benefits or compensation are hereby waived, except those expressly stated in the preceding sentence.

The Executive hereby acknowledges his understanding that under this Agreement he is releasing any known or unknown claims he may have.

The Executive expressly waives and relinquishes all rights and benefits under that section and any law of any jurisdiction of similar effect with respect to his release of claims.

EXHIBIT B EXISTING CONFLICTS

If applicable, Executive to describe, in specific terms, any ongoing business relationship with any organization. Please provide a copy of any agreement(s) you might have with said organization(s) that creates a business relationship described in Section 3 (d).

May 28, 2018

Mr. David Hastings
Delivered by email:

Dear David,

Re: Signing Bonus
Further to our discussions and the employment offer outlined in the attached Executive Employment Agreement between you and Arbutus Biopharma, Inc. ("Arbutus" or the "Company"), effective June 11, 2018 (the "Start Date"), I am pleased to offer a signing bonus as follows:

Should you accept the terms of the Executive Employment Agreement and commence employment on the Start Date, you will be eligible for a $75,000.00 signing bonus, to be paid on the first scheduled payday following completion of your first month of employment, subject to required withholdings. You agree that should you resign your position with Arbutus within eighteen (18) months of your Start Date, you will repay the signing bonus paid, net of taxes.

If you are in agreement with these terms, please sign where indicated below and return a signed copy of this letter to my attention. Should you have any questions regarding this letter, the Executive Employment Agreement, or anything else, please do not hesitate to call me.

Best regards,

Mark Murray
President and Chief Executive Officer

ACCEPTED AND AGREED:

DAVID HASTINGS

_____

(Signature)

_____

Date

Exhibit 21.1

Arbutus Biopharma Corporation

List of Subsidiaries

Name	Jurisdiction
Arbutus Biopharma Inc.	Delaware, United States of America
Arbutus Biopharma US Holdings, Inc.	Delaware, United States of America

Exhibit 23.1

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

The Board of Directors

Arbutus Biopharma Corporation

We consent to the incorporation by reference in the registration statement (No. 333-215290) on Form S-3, as amended, and registration statements (No. 333-228919, No. 333-202762, No. 333-212115, and No. 333-186185) on Form S-8 of Arbutus Biopharma Corporation of our reports dated March 7, 2019 with respect to the consolidated balance sheets of Arbutus Biopharma Corporation as at December 31, 2018 and December 31, 2017 and the related consolidated statements of operations and comprehensive loss, stockholders' equity, and cash flows for each of the years in the two-year period ended December 31, 2018, and the effectiveness of internal control over financial reporting as of December 31, 2018, which reports appear in the annual report on Form 10-K of Arbutus Biopharma Corporation for the year ended December 31, 2018.

Our report on the consolidated financial statements refers to changes in accounting policies for revenue in 2018 due to the adoption of ASC 606 - *Revenue from Contracts with Customers*.

/s/ KPMG LLP
Chartered Professional Accountants

Vancouver, Canada

March 7, 2019

Exhibit 31.1

CERTIFICATION PURSUANT TO RULE 13a-14 AND 15d-14 OF THE SECURITIES

EXCHANGE ACT OF 1934, AS ADOPTED PURSUANT TO SECTION 302 OF THE

SARBANES-OXLEY ACT OF 2002

I, Mark J. Murray, President and Chief Executive Officer of Arbutus Biopharma Corporation, certify that:

1. I have reviewed this Form 10-K;
2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;
3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;
4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:
   (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;
   (b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;
   (c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and
   (d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an the annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and
5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):
   (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and
   (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: March 7, 2019

/s/ Mark J. Murray

Name: Mark J. Murray

Title: President and Chief Executive Officer

(Principal Executive Officer)

Exhibit 31.2

CERTIFICATION PURSUANT TO RULE 13a-14 AND 15d-14 OF THE SECURITIES

EXCHANGE ACT OF 1934, AS ADOPTED PURSUANT TO SECTION 302 OF THE

SARBANES-OXLEY ACT OF 2002

I, David Hastings, Chief Financial Officer of Arbutus Biopharma Corporation, certify that:

1. I have reviewed this Form 10-K;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

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

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

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

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

5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

   a. All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

   b. Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting

Date: March 7, 2019

/s/ David Hastings

Name: David Hastings

Title: Chief Financial Officer

Exhibit 32.1

CERTIFICATION PURSUANT TO 18 U.S.C. SECTION 1350,

AS ADOPTED PURSUANT TO SECTION 906

OF THE SARBANES-OXLEY ACT OF 2002

In connection with the Annual Report of Arbutus Biopharma Corporation (the "Company") on Form 10-K for the year ended December 31, 2018, as filed with the Securities and Exchange Commission on the date hereof (the "Report"), I Mark J. Murray, President and Chief Executive Officer of the Company, certify that to the best of my knowledge:

1. The Report fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934, as amended; and

2. The information contained in the Report fairly presents, in all material respects, the financial condition and results of the operations of the Company.

Date: March 7, 2019

/s/ Mark J. Murray

Name: Mark J. Murray

Title: President and Chief Executive Officer

(Principal Executive Officer)

Exhibit 32.2

CERTIFICATION PURSUANT TO 18 U.S.C. SECTION 1350,

AS ADOPTED PURSUANT TO SECTION 906

OF THE SARBANES-OXLEY ACT OF 2002

In connection with the Annual Report of Arbutus Biopharma Corporation (the "Company") on Form 10-K for the year ended December 31, 2018, as filed with the Securities and Exchange Commission on the date hereof (the "Report"), I David Hastings, Chief Financial Officer of the Company, certify that to the best of my knowledge:

1. The Report fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934, as amended; and

2. The information contained in the Report fairly presents, in all material respects, the financial condition and results of the operations of the Company.

Date: March 7, 2019

/s/ David Hastings

Name: David Hastings

Title: Chief Financial Officer