Aeterna Zentaris Inc.
Form 20-F
April 01, 2019

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

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FORM 20-F

¨Registration Statement Pursuant to Section 12(b) or 12(g) of The Securities Exchange Act of 1934

OR

ý Annual Report Pursuant to Section 13 or 15(d) of The Securities Exchange Act of 1934 for the fiscal year ended December 31, 2018

OR

¨Transition Report Pursuant to Section 13 or 15(d) of The Securities Exchange Act of 1934

OR

¨Shell Company Report Pursuant to Section 13 or 15(d) of The Securities Exchange Act of 1934

Commission file number 0-30752

AETERNA ZENTARIS INC.
(Exact Name of Registrant as Specified in its Charter)

Not Applicable
(Translation of Registrant's Name into English)

Canada
(Jurisdiction of Incorporation)

315 Sigma Drive
Summerville, South Carolina, USA
29486
(Address of Principal Executive Offices)

Michael V. Ward
Telephone: 843-900-3201
E-mail: mward@aezsinc.com
315 Sigma Drive
Summerville, South Carolina
29486
(Name, Telephone, E-mail and Address of Company Contact Person)

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

Title of Each Class	Name of Each Exchange on Which Registered
Common Shares	NASDAQ Capital Market Toronto Stock Exchange

Securities registered or to be registered pursuant to Section 12(g) of the Act: NONE

Securities for which there is a reporting obligation pursuant to Section 15(d) of the ACT: NONE

Indicate the number of outstanding shares of each of the issuer's classes of capital or common stock as at the close of the period covered by the annual report: 16,440,760 Common Shares as at December 31, 2018.

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

If this report is an annual or transition report, indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934. Yes ¨ No ý

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

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

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

Large accelerated filer ¨ Accelerated filer ¨ Non-accelerated filer ý Emerging growth company ¨

If an emerging growth company that prepares its financial statements in accordance with U.S. GAAP, 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.

† The term "new or revised financial accounting standard" refers to any update issued by the Financial Accounting Standards Board to its Accounting Standards Codification after April 5, 2012

Indicate by check mark which basis of accounting the registrant has used to prepare the financial statements included in this filing:

US GAAP ¨ International Financial Reporting Standards as issued by the International Accounting Standards Board ý Other ¨

If "other" has been checked in response to the previous question, indicate by check mark which financial statement item the registrant has elected to follow. Item 17 ¨ Item 18 ¨

If this is an annual report, indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act). Yes ¨ No ý

Basis of Presentation

General

Except where the context otherwise requires, all references in this Annual Report on Form 20-F to the "Company", "Aeterna Zentaris", "we", "us", "our" or similar words or phrases are to Aeterna Zentaris Inc. and its subsidiaries, taken together. In this Annual Report on Form 20-F, references to "$" and "U.S.$" are to United States ("U.S.") dollars, references to "CAN$" are to Canadian dollars and references to "EUR" are to euros. Unless otherwise indicated, the statistical and financial data contained in this Annual Report on Form 20-F are presented as at December 31, 2018.

All share, option and share purchase warrant as well as per share, option and share purchase warrant information presented in this Annual Report on Form 20-F have been adjusted, including proportionate adjustments being made to each option and share purchase warrant exercise price, to reflect and to give effect to a share consolidation (or reverse stock split), on November 17, 2015, of our issued and outstanding common shares on a 100-to-1 basis (the "Share Consolidation"). The Share Consolidation affected all shareholders, optionholders and warrantholders uniformly and thus did not materially affect any securityholder's percentage of ownership interest.

This Annual Report on Form 20-F also contains certain information regarding products or product candidates that may potentially compete with our products and product candidates, and such information has been primarily derived from information made publicly available by the companies developing such potentially competing products and product candidates and has not been independently verified by Aeterna Zentaris Inc.

Forward-Looking Statements

This Annual Report on Form 20-F contains forward-looking statements made pursuant to the safe-harbor provision of the U.S. Securities Litigation Reform Act of 1995, which reflect our current expectations regarding future events. Forward-looking statements may include, but are not limited to statements preceded by, followed by, or that include the words "will," "expects," "believes," "intends," "would," "could," "may," "anticipates," and similar terms that relate to future events, performance, or our results. Forward-looking statements involve known risks and uncertainties, including those discussed in this Annual Report on Form 20-F, under the caption "Key Information - Risk Factors" filed with the relevant Canadian securities regulatory authorities in lieu of an annual information form and with the U.S. Securities and Exchange Commission ("SEC"). Known and unknown risks and uncertainties could cause our actual results to differ materially from those in forward-looking statements. Such risks and uncertainties include, among others, our now heavy dependence on the success of Macrilen™ (macimorelin) and related out-licensing arrangements and the continued availability of funds and resources to successfully launch the product, the ability of Aeterna Zentaris to enter into out-licensing, development, manufacturing and marketing and distribution agreements with other pharmaceutical companies and keep such agreements in effect, reliance on third parties for the manufacturing and commercialization of our product candidates, potential disputes with third parties, leading to delays in or termination of the manufacturing, development, out-licensing or commercialization of our product candidates, or resulting in significant litigation or arbitration, and, more generally, uncertainties related to the regulatory process, the ability of the Company to efficiently commercialize or out-license Macrilen™ (macimorelin), the degree of market acceptance of Macrilen™ (macimorelin), our ability to obtain necessary approvals from the relevant regulatory authorities to enable us to use the desired brand names for our products, the impact of securities class action litigation, on our cash flow, results of operations and financial position; any evaluation of potential strategic alternatives to maximize potential future growth and stakeholder value may not result in any such alternative being pursued, and even if pursued, may not result in the anticipated benefits, our ability to take advantage of business opportunities in the pharmaceutical industry, our ability to protect our intellectual property, the potential of liability arising from shareholder lawsuits and general changes in economic conditions. Investors should consult the Company's quarterly and annual filings with the Canadian and U.S. securities commissions for additional information on risks and uncertainties. Given these uncertainties and risk factors, readers are cautioned not to place undue reliance on these forward-looking statements. We disclaim any obligation to update any such factors or to publicly announce any revisions to any of the forward-looking statements contained herein to reflect future results, events or developments, unless required to do so by a governmental authority or applicable law.

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GENERAL INFORMATION

PART I

Item 1. Identity of Directors, Senior Management and Advisers

A. Directors and senior management

Not applicable.

B. Advisers

Not applicable.

C. Auditors

Not applicable.

Item 2. Offer Statistics and Expected Timetable

A. Offer statistics

Not applicable.

B. Method and expected timetable

Not applicable.

Item 3. Key Information

A. Selected financial data

The consolidated statement of comprehensive income (loss) information set forth in this Item 3.A. with respect to the years ended December 31, 2018, 2017 and 2016 and the consolidated statement of financial position information as at December 31, 2018 and 2017 have been derived from the audited consolidated financial statements set forth in Item 18, which have been prepared in accordance with International Financial Reporting Standards ("IFRS"), as issued by the International Accounting Standards Board ("IASB"). The consolidated statement of comprehensive income (loss) information with respect to the years ended December 31, 2015 and 2014 and the consolidated statement of financial position information as at December 31, 2016, 2015 and 2014 set forth in this Item 3.A. have been derived from our previous consolidated financial statements not included herein, and have also been prepared in accordance with IFRS, as issued by the IASB. The selected financial data should be read in conjunction with our audited consolidated financial statements and the related notes included elsewhere in this Annual Report on Form 20-F, as well as "Item 5. – Operating and Financial Review and Prospects" of this Annual Report on Form 20-F.

The Company has not declared or paid any dividends per share during the periods covered by the selected financial data.

Consolidated Statements of Comprehensive Income (Loss) Information
(in thousands of U.S. dollars, except share and per share data)
Derived from consolidated audited financial statements prepared in accordance with IFRS, as issued by the IASB

	December 31,				
	2018	2017	2016	2015	2014
	$	$	$	$	$
Revenues					
License fees	24,325	458	497	248	11
Product sales	2,167	—	—	—	—
Royalty income	184	—	—	—	—
Sales commission and other	205	465	414	297	—
	26,881	923	911	545	11
Cost of sales	2,104	—	—	—	—
Research and development costs	2,932	10,704	16,495	17,234	23,716
General and administrative expenses	8,894	8,198	7,147	11,308	9,840
Selling expenses	3,109	5,095	6,745	6,887	3,850
	17,039	23,997	30,387	35,429	37,406
Income (loss) from operations	9,842	(23,074)	(29,476)	(34,884)	(37,395)
Settlements	(1,400)	—	—	—	—
Gain (loss) due to changes in foreign currency exchange rates	656	502	(70)	(1,767)	1,879
Change in fair value of warrant liability	263	2,222	4,437	(10,956)	18,272
Warrant exercise inducement fee	—	—	—	(2,926)	—
Other finance income	278	75	150	305	168
Net finance income (costs)	1,197	2,799	4,517	(15,344)	20,319
Income (loss) before income taxes	9,639	(20,275)	(24,959)	(50,228)	(17,076)
Income tax recovery (expense)	(5,452)	3,479	—	—	(111)
Net income (loss) from operations	4,187	(16,796)	(24,959)	(50,228)	(17,187)
Net income from discontinued operations	—	—	—	85	623
Net (loss) income	4,187	(16,796)	(24,959)	(50,143)	(16,564)
Other comprehensive income (loss):					
Items that may be reclassified subsequently to profit or loss:					
Foreign currency translation adjustments	(260)	(1,430)	569	1,509	(1,158)
Items that will not be reclassified to profit or loss:					
Actuarial gain (loss) on defined benefit plans	193	694	(1,479)	844	(1,833)
Comprehensive (loss) income	4,120	(17,532)	(25,869)	(47,790)	(19,555)
Basic Net income (loss) per share from continuing operations[(1)]	0.25	(1.12)	(2.41)	(18.17)	(29.12)
Diluted Net income (loss) per share from continuing operations[(1)]	0.24	(1.12)	(2.41)	(18.17)	(29.12)
Net income per share (basic and diluted) from discontinued operations[1]	—	—	—	0.03	1.06
Net (loss) income per share (basic)[1]	0.25	(1.12)	(2.41)	(18.14)	(28.06)
Net (loss) income per share (diluted)[1]	0.24	(1.12)	(2.41)	(18.14)	(28.06)
Weighted average number of shares outstanding:					
Basic	16,440,760	14,958,704	10,348,879	2,763,603	590,247
Diluted	17,034,812	14,958,704	10,348,879	2,763,603	590,247

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[1] Adjusted to reflect the November 17, 2015 100-to-1 Share Consolidation

Consolidated Statement of Financial Position Information
(in thousands of U.S. dollars)
Derived from consolidated financial statements prepared in accordance with IFRS, as issued by the IASB

	As at December 31,				
	2018	2017	2016	2015	2014
	$	$	$	$	$
Cash and cash equivalents	14,512	7,780	21,999	41,450	34,931
Restricted cash equivalents	418	381	496	255	760
Total assets	25,011	22,195	31,659	51,498	47,435
Warrant liability (current and non-current portion)	3,634	3,897	6,854	10,891	8,225
Share capital	222,335	222,335	213,980	204,596	150,544
Shareholders' (deficiency) equity	1,907	(2,783)	6,212	21,615	14,484

B. Capitalization and indebtedness

Not applicable.

C. Reasons for the offer and use of proceeds

Not applicable.

D. Risk factors

An investment in our securities involves a high degree of risk. You should carefully consider the risks described below, together with all of the other information included in this Annual Report, before making an investment decision. If any of the following risks actually occurs, our business, prospects, financial condition or results of operations could suffer. In that case, the trading price, if any, of our securities could decline, and you may lose all or part of your investment.

Risks Relating to Us and Our Business

Investments in biopharmaceutical companies are generally considered to be speculative in nature.

The prospects for companies operating in the biopharmaceutical industry are uncertain, given the very nature of the industry, and, accordingly, investments in biopharmaceutical companies should be considered to be speculative assets.

We have a history of operating losses and we may never achieve or maintain operating profitability. If we are unsuccessful in generating new revenue, increasing our revenues and/or raising additional funding, we may not be able to continue as a going concern.

We have incurred, and expect to continue to incur, substantial expenses in our efforts to develop and commercialize products. Consequently, we have incurred operating losses historically and in each of the last several years. As at December 31, 2018, we had an accumulated deficit of approximately $310 million. Our operating losses have adversely impacted, and will continue to adversely impact, our working capital, total assets, operating cash flow and shareholders' equity. We do not expect to reach operating profitability in the immediate future, and our operating expenses are likely to continue to represent a significant component of our overall cost profile as we focus on the commercialization of Macrilen™ (macimorelin). In developing, acquiring, or out-licensing Macrilen™ (macimorelin), we could incur additional operating losses for at least the next several years. If we do not ultimately generate sufficient revenue from a commercialized product and achieve or maintain operating profitability, an investment in our Common Shares or other securities could result in a significant or total loss.

Our ability to continue as a going concern is dependent on the successful execution of our business plan, which will require an increase in revenue and/or additional funding to be provided by potential investors and/or non-traditional sources of financing. In 2018, our primary source of liquidity was the $24.0 million licensing payment received from Strongbridge Biopharma plc in January 2018.

We stated in our management's discussion and analysis of financial condition and results of operations for the year ended 2018 that we expect existing cash balances and operating cash flows will provide us with adequate funds to support our current operating plan for at least twelve months. There can be no assurance, however, that unplanned capital requirements or other future events, will not require us to seek debt or equity financing and, if so required, that it will be available on terms acceptable to us, if at all.

Additional funding may be in the form of debt or equity or a hybrid instrument depending on our needs, the demands of investors and market conditions. Depending on the prevailing global economic and credit market conditions, we may not be able to raise additional cash through these traditional sources of financing. Although we may also pursue non-traditional sources of financing with third parties, the global equity and credit markets may adversely affect the ability of potential third parties to pursue such transactions with us. Accordingly, as a result of the foregoing, we continue to review traditional sources of financing, such as private and public debt or various equity financing alternatives, as well as other alternatives to enhance shareholder value, including, but not limited to, non-traditional sources of financing, such as strategic alliances with third parties, the sale of assets or licensing of our technology or intellectual property, a combination of operating and related initiatives or a substantial reorganization of our business. There can be no assurance that we will achieve profitability or positive cash flows or be able to obtain additional funding or that, if obtained, the additional funding will be sufficient, or whether any other initiatives will be successful such that we may continue as a going concern. If we do not ultimately achieve operating profitability, an investment in our Common Shares or other securities could result in a significant or total loss. There could also be material uncertainties related to certain adverse conditions and events that could impact our ability to remain a going concern. If the going concern assumptions were deemed no longer appropriate for our consolidated financial statements, adjustments to the carrying value of assets and liabilities, reported expenses and consolidated statement of financial position classifications would be necessary. Such adjustments could be material.

If we are unable to successfully commercialize or out-license Macrilen™ (macimorelin), or if we experience significant delays in doing so, our business would be materially harmed, and the future and viability of our Company could be imperiled.

Our principal focus is on the licensing and development of Macrilen™ (macimorelin) and we currently do not have any other product. The Company is a party to a license and assignment agreement with a subsidiary of Novo Nordisk A/S ("Novo") to carry out development, manufacturing, registration and commercialization of Macrilen™ (macimorelin) in the U.S. and Canada (the "License and Assignment Agreement"). The Company continues to explore licensing opportunities worldwide.

The commercial success of Macrilen™ (macimorelin) depends on several factors, including the following:

- receipt of approvals from foreign regulatory authorities;
- successfully contracting with qualified third-party suppliers to manufacture Macrilen™ (macimorelin);
- developing appropriate distribution and marketing infrastructure and arrangements for our product;
- launching and growing commercial sales of the product;
- out-licensing Macrilen™ (macimorelin) to third parties; and
- acceptance of the product in the medical community, among patients and with third party payers.

If we are unable to successfully achieve any of these factors, our business, financial condition and results of operations may be materially adversely affected.

Our revenues and expenses may fluctuate significantly, and any failure to meet financial expectations may disappoint securities analysts or investors and result in a decline in the price or the value of our Common Shares or other securities.

We have a history of operating losses. Our revenues and expenses have fluctuated in the past and may continue to do so in the future. These fluctuations could cause our share price or the value of our other securities to decline. Some of the factors that could cause our revenues and expenses to fluctuate include but are not limited to:

- the timing and willingness of any current or future collaborators to invest the resources necessary to commercialize Macrilen™ (macimorelin);

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- not obtaining necessary regulatory approvals from the U.S. Food and Drug Administration ("FDA"), European Medicines Agency ("EMA") and other agencies that may delay or prevent us from obtaining approval of a pediatric indication for Macrilen™ (macimorelin), which may affect the price of our securities;
- the timing of regulatory submissions and approvals;
- the nature and timing of licensing fee revenues;
- the outcome of litigation, including the securities class action litigation pending against us that is described elsewhere in this Annual Report on Form 20-F;
- foreign currency fluctuations;
- the timing of the achievement and the receipt of milestone payments from current or future licensing partners; and
- failure to enter into new or the expiration or termination of current agreements with suppliers who manufacture Macrilen™ (macimorelin).

Due to fluctuations in our revenues and expenses, we believe that period-to-period comparisons of our results of operations are not necessarily indicative of our future performance. It is possible that in some future periods, our revenues and expenses will be above or below the expectations of securities analysts or investors. In this case, the price of our Common Shares and the value of our other securities could fluctuate significantly or decline.

If we are unable to successfully complete the pediatric clinical trial program for Macrilen™ (macimorelin), or if such clinical trial takes longer to complete than we project, our ability to execute any related business strategy will be adversely affected.

If we experience delays in identifying and contracting with sites and/or in-patient enrollment in our pediatric clinical trial program for Macrilen™ (macimorelin), we may incur additional costs and delays in our development programs, and may not be able to complete our clinical trials on a cost-effective or timely basis. In addition, conducting multi-national studies adds another level of complexity and risk as we are subject to events affecting countries other than the U.S. and Canada. Moreover, negative or inconclusive results from the clinical trials we conduct or adverse medical events could cause us to have to repeat or terminate the clinical trials. Accordingly, we may not be able to complete the pediatric clinical trial within an acceptable time-frame, if at all. If we or our contract resource organization (a "CRO") have difficulty enrolling a sufficient number of patients to conduct our clinical trials as planned, we may need to delay or terminate ongoing clinical trials.

Clinical trials are subject to continuing oversight by governmental regulatory authorities and institutional review boards and must, among other requirements:

- meet the requirements of these authorities from multiple countries and jurisdictions and their related statutes, regulations, and guidances;
- meet the requirements for informed consent;
- meet the requirements for institutional review boards; and
- meet the requirements for good clinical practices

We are currently dependent on certain strategic relationships with third parties for the development, manufacturing and licensing of Macrilen™ (macimorelin) and we may enter into future collaborations for the development, manufacturing and licensing of Macrilen™ (macimorelin).

We are currently dependent on certain strategic relationships with third parties for the development, manufacturing and licensing of Macrilen™ (macimorelin), and may enter into future collaborations for the development, manufacturing and licensing of Macrilen™ (macimorelin). Our arrangements with these third parties may not provide us with the benefits we expect and may expose us to a number of risks.

Currently, we are dependent on Novo to commercialize Macrilen™ (macimorelin) in the U.S and Canada. Most of our potential revenue consists of contingent payments, including regulatory milestones and royalties on the sale of Macrilen™ (macimorelin). The milestone and royalty revenue that we may receive under this collaboration will depend upon Novo’s ability to successfully introduce, market and sell Macrilen™ (macimorelin) in the United States. If Novo does not devote sufficient time and resources to its collaboration arrangement with us, we may not realize the potential commercial benefits of the arrangement, and our results of operations may be materially adversely affected.

Our reliance on relationships with Novo and other potential third parties poses a number of risks. We may not realize the contemplated benefits of such agreements nor can we be certain that any of these parties will fulfill their obligations in a manner which maximizes our revenue. These arrangements may also require us to transfer certain material rights to third parties. These agreements create certain additional risks. The occurrence of any of the following or other events may delay or impair commercialization of Macrilen™ (macimorelin):

- in certain circumstances, third parties may assign their rights and obligations under these agreements to other third parties without our consent or approval;
- the third parties may cease to conduct business for financial or other reasons;
- we may not be able to renew such agreements;
- the third parties may not properly maintain or defend certain intellectual property rights that may be important to the commercialization of Macrilen™ (macimorelin);
- the third parties may encounter conflicts of interest, changes in business strategy or other issues which could adversely affect their willingness or ability to fulfill their obligations to us (for example, pharmaceutical companies historically have re-evaluated their priorities following mergers and consolidations, which have been common in this industry);
- delays in, or failures to achieve, scale-up to commercial quantities, or changes to current raw material suppliers or product manufacturers (whether the change is attributable to us or the supplier or manufacturer) could delay clinical studies, regulatory submissions and commercialization of Macrilen™ (macimorelin); and
- disputes may arise between us and the third parties that could result in the delay or termination of the manufacturing or commercialization of Macrilen™ (macimorelin), resulting in litigation or arbitration that could be time-consuming and expensive, or causing the third parties to act in their own self-interest and not in our interest or those of our shareholders.

i. In addition, the third parties can terminate our agreements with them for a number of reasons based on the terms of the individual agreements that we have entered into with them. If one or more of these agreements were to be terminated, we would be required to devote additional resources to manufacturing and commercializing Macrilen™ (macimorelin), which would likely cause a drop in the price of our Common Shares.

We may be unsuccessful in consummating further out-licensing arrangements for Macrilen™ (macimorelin) on favorable terms and conditions, or we may be significantly delayed in doing so.

As part of our product development and commercialization strategy, we are evaluating out-licensing opportunities for Macrilen™ (macimorelin) in addition to the License and Assignment Agreement. If we elect to collaborate with third parties in respect of Macrilen™ (macimorelin), we may not be able to negotiate a collaborative arrangement for Macrilen™ (macimorelin) on favorable terms and conditions, if at all. Should any partner fail to successfully commercialize Macrilen™ (macimorelin), our business, financial condition and results of operations may be adversely affected.

We may require significant additional financing, and we may not have access to sufficient capital.

We may require significant additional capital to fund our commercial operations and may require additional capital to pursue planned clinical trials and regulatory approvals. Although we have capital from the License and Assignment Agreement, we do not anticipate generating significant revenues from operations in the near future other than from the License and Assignment Agreement, and we currently have no committed sources of capital.

We may attempt to raise additional funds through public or private financings, collaborations with other pharmaceutical companies or from other sources, including, without limitation, through at-the-market offerings and issuances of Common Shares. Additional funding may not be available on terms that are acceptable to us. If adequate funding is not available to us on reasonable terms, we may need to delay, reduce or eliminate one or more of our product development programs or obtain funds on terms less favorable than we would otherwise accept. To the extent that additional capital is raised through the sale of equity securities or securities convertible into or exchangeable or exercisable for equity securities, the issuance of those securities would result in dilution to our shareholders. Moreover, the incurrence of debt financing or the issuance of dividend-paying preferred shares, could result in a substantial portion of our future operating cash flow, if any, being dedicated to the payment of principal and interest on such indebtedness or the payment of dividends on such preferred shares and could impose restrictions on our

operations and on our ability to make certain expenditures and/or to incur additional indebtedness, which could render us more vulnerable to competitive pressures and economic downturns.

Our future capital requirements are substantial and may increase beyond our current expectations depending on many factors, including:

- the duration of changes to and results of our clinical trials for any future products going forward;
- unexpected delays or developments in seeking regulatory approvals;
- the time and cost involved in preparing, filing, prosecuting, maintaining and enforcing patent claims;
- unexpected developments encountered in implementing our business development and commercialization strategies;
- the potential addition of commercialized products to our portfolio;
- the outcome of current and future litigation, including the securities class action litigation pending against us that is described elsewhere in this Annual Report on Form 20-F; and
- further arrangements, if any, with collaborators.

In addition, global economic and market conditions as well as future developments in the credit and capital markets may make it even more difficult for us to raise additional financing in the future.

We are and will be subject to stringent ongoing government regulation for our products and our product candidates, even if we obtain regulatory approvals for the latter.

The manufacture, marketing and sale of Macrilen™ (macimorelin) are and will be subject to strict and ongoing regulation, even with marketing approval by the FDA and EMA for Macrilen™ (macimorelin). Compliance with such regulation will be expensive and consume substantial financial and management resources. For example, the EMA approval for macimorelin was conditioned on our agreement to conduct post-marketing follow-up studies to monitor the safety or efficacy of the product. In addition, as clinical experience with a drug expands after approval because the drug is used by a greater number and more diverse group of patients than during clinical trials, side effects or other problems may be observed after approval that were not observed or anticipated during pre-approval clinical trials. In such a case, a regulatory authority could restrict the indications for which the product may be sold or revoke the product's regulatory approval.

We and our contract manufacturers will be required to comply with applicable Current Good Manufacturing Practice regulations for the manufacture of our current or future products and other regulations. These regulations include requirements relating to quality assurance, as well as the corresponding maintenance of rigorous records and documentation. Manufacturing facilities must be approved before we can use them in the commercial manufacturing of a product and are subject to subsequent periodic inspection by regulatory authorities. In addition, material changes in the methods of manufacturing or changes in the suppliers of raw materials are subject to further regulatory review and approval.

If we, or if any future marketing collaborators or contract manufacturers, fail to comply with applicable regulatory requirements, we may be subject to sanctions including fines, product recalls or seizures and related publicity requirements, injunctions, total or partial suspension of production, civil penalties, suspension or withdrawals of previously granted regulatory approvals, warning or untitled letters, refusal to approve pending applications for marketing approval of new products or of supplements to approved applications, complete withdrawal of a marketing application, exclusion from government healthcare programs, import or export bans or restrictions, and/or criminal prosecution and penalties. Any of these penalties could delay or prevent the promotion, marketing or sale of a product. Even with marketing approval for Macrilen™ (macimorelin), such product approval could be subject to restrictions or withdrawals. Regulatory requirements are subject to change.

On December 20, 2017, the FDA granted marketing approval in the United States for Macrilen™ (macimorelin) to be used in the diagnosis of patients with adult growth hormone deficiency ("AGHD") and on January 16, 2019, the EMA granted marketing approval in Europe for macimorelin for the diagnosis of AGHD. Regulatory authorities generally approve products for specified indications. If an approval is for a limited indication, this limitation reduces the size of the potential market for that product. Product approvals, once granted, are subject to continual review and periodic inspections by regulatory authorities. Our operations and practices are subject to regulation and scrutiny by the U.S. government, as well as governments of any other countries in which we do business or conduct activities. Later discovery of previously unknown problems or safety issues and/or failure to comply with domestic or foreign laws, knowingly or unknowingly, can result in various adverse consequences, including, among other things, a possible delay in the approval or refusal to approve a product, warning or untitled letters, fines, injunctions, civil penalties,

recalls or seizures of products and related publicity requirements, total or partial suspension of production, import or export bans or restrictions, refusal of the government to renew marketing applications, complete withdrawal of a marketing

application, criminal prosecution and penalties, suspension or withdrawals of previously granted regulatory approvals, withdrawal of an approved product from the market and/or exclusion from government healthcare programs. Such regulatory enforcement could have a direct and negative impact on the product for which approval is granted, but also could have a negative impact on the approval of any pending applications for marketing approval of new drugs or supplements to approved applications.

Because we operate in a highly regulated industry, regulatory authorities could take enforcement action against us in connection with our licensees' or collaborators', business and marketing activities for various reasons.

From time to time, new legislation is passed into law that could significantly change the statutory provisions governing the approval, manufacturing, and marketing of products regulated by the FDA, EMA and other health authorities. Additionally, regulations and guidance are often revised or reinterpreted by health agencies in ways that may significantly affect our business Macrilen™ (macimorelin). It is impossible to predict whether further legislative changes will be enacted, or whether regulations, guidance, or interpretations will change, and what the impact of such changes, if any, may be.

Healthcare reform measures could hinder or prevent the commercial success of a product and adversely affect our business.

The business prospects and financial condition of pharmaceutical and biotechnology companies are affected by the efforts of governmental and third-party payers to contain or reduce the costs of healthcare. The U.S. government and other governments have shown significant interest in pursuing healthcare reform and reducing healthcare costs. Any government-adopted reform measures could cause significant pressure on the pricing of healthcare products and services, including Macrilen™ (macimorelin), both in the U.S. and internationally, as well as the amount of reimbursement available from governmental agencies and other third-party payers. If reimbursement for Macrilen™ (macimorelin) is substantially less than we expect, our revenue prospects could be materially and adversely impacted.

In the U.S. and in other jurisdictions there have been, and we expect that there will continue to be, a number of legislative and regulatory proposals aimed at changing the healthcare system, such as proposals relating to the pricing of healthcare products and services in the U.S. or internationally, the reimportation of drugs into the U.S. from other countries (where they are then sold at a lower price), and the amount of reimbursement available from governmental agencies or other third party payers. Furthermore, the pricing of pharmaceutical products, in general, and specialty drugs, in particular, has been a topic of concern in the U.S. Congress, where hearings on the topic have been held, and has been a topic of speeches given by political figures, including President Donald Trump. Additionally, in the U.S., states have also passed legislation and proposed bills that are aimed at drug pricing transparency, which will likely impact drug pricing. There can be no assurance as to how this scrutiny on pricing of pharmaceutical products will impact future pricing of Macrilen™ (macimorelin).

The Patient Protection and Affordable Care Act and the Healthcare and Education Affordability Reconciliation Act of 2010 (collectively, the "ACA") has had far-reaching consequences for most healthcare companies, including specialty biopharmaceutical companies like us. The future of the ACA is, however, uncertain. Since January 2017, the U.S. Congress has proposed various bills to revise the ACA. Additionally, President Donald Trump has suggested similar action and enacted Executive Orders to curtail the ACA and its impacts on healthcare in the U.S. We cannot predict the ultimate content, timing or effect of any healthcare reform legislation, or potential legislation, regulation, and orders or their impact on us.

In addition, the Food and Drug Administration Amendments Act of 2007 gives the FDA enhanced post-market authority, including the authority to require post-marketing studies and clinical trials, labeling changes based on new safety information, and compliance with risk evaluations and mitigation strategies approved by the FDA. The FDA's exercise of this authority may result in delays or increased costs during the period of product development, clinical trials and regulatory review and approval, which may also increase costs related to complying with new post-approval regulatory requirements, and increase potential FDA restrictions on the sale or distribution of approved products.

If we or our licensees market products or interact with health care practitioners in a manner that violates healthcare fraud and abuse laws, we or our licensees may be subject to civil or criminal penalties, including exclusion from participation in government healthcare programs.

As a pharmaceutical company, even though we do not provide healthcare services or receive payments directly from or bill directly to Medicare, Medicaid or other third-party payers for our current product, certain federal and state healthcare laws and regulations pertaining to fraud and abuse are and will be applicable to our business. We and our licensees are subject to healthcare fraud and abuse regulation by both the federal government and the states in which we conduct our business.

The laws that may affect our and our licensee's ability to operate include the federal healthcare program anti-kickback statute, which prohibits, among other things, knowingly and willfully offering, paying, soliciting, or receiving remuneration to induce, or in return for, the purchase, lease, order, or arrangement for the purchase, lease or order of any healthcare item or service reimbursable under Medicare, Medicaid or other federally financed healthcare programs. This statute applies to arrangements between pharmaceutical manufacturers and prescribers, purchasers and formulary managers. Although there are a number of statutory exceptions and regulatory safe harbors protecting certain common activities, the exceptions and safe harbors are drawn narrowly, and practices that involve remuneration intended to induce prescribing, purchases or recommendations may be subject to scrutiny if they do not qualify for an exception or safe harbor.

Federal false claims laws prohibit any person from knowingly presenting, or causing to be presented, a false claim for payment to the federal government, or knowingly making, or causing to be made, a false statement to get a false claim paid. Pharmaceutical companies have been prosecuted under these laws for a variety of alleged promotional and marketing activities, such as providing free product to customers with the expectation that the customers would bill federal programs for the product; reporting to pricing services inflated average wholesale prices that were then used by federal programs to set reimbursement rates; engaging in off-label promotion that caused claims to be submitted to Medicaid for non-covered off-label uses; and submitting inflated best price information to the Medicaid Drug Rebate Program.

The Health Insurance Portability and Accountability Act of 1996 also created prohibitions against healthcare fraud and false statements relating to healthcare matters. The healthcare fraud statute prohibits knowingly and willfully executing a scheme to defraud any healthcare benefit program, including private payers. The false statements statute prohibits knowingly and willfully falsifying, concealing or covering up a material fact or making any materially false, fictitious or fraudulent statement in connection with the delivery of or payment for healthcare benefits, items or services.

In addition, there has been a recent trend of increased federal and state regulation of payments made to physicians. The ACA, through the Physician Payment Sunshine Act, imposed new requirements on manufacturers of drugs, devices, biologics and medical supplies for which payment is available under Medicare, Medicaid or the Children's Health Insurance Program (with certain exceptions) to report annually to the Centers for Medicare and Medicaid Services ("CMS") information related to payments or other "transfers of value" made to physicians (defined to include doctors, dentists, optometrists, podiatrists and chiropractors) and teaching hospitals, and applicable manufacturers and group purchasing organizations to report annually to CMS ownership and investment interests held by physicians (as defined above) and their immediate family members and payments or other "transfers of value" to such physician owners and their immediate family members. Manufacturers are required to report such data to the government by the 90th calendar day of each year.

The majority of states also have statutes or regulations similar to these federal laws, which apply to items and services reimbursed under Medicaid and other state programs, or, in several states, apply regardless of the payer. In addition, some states have laws that require pharmaceutical companies to adopt comprehensive compliance programs. For example, under California law, pharmaceutical companies must comply with both the April 2003 Office of Inspector General Compliance Program Guidance for Pharmaceutical Manufacturers and the PhRMA Code on Interactions with Healthcare Professionals, as amended. Certain states also mandate the tracking and reporting of gifts, compensation, and other remuneration paid by us to physicians and other healthcare providers.

Although compliance programs can mitigate the risk of investigation and prosecution for violations of these laws, the risks cannot be entirely eliminated. Any action against us or our licensees for violation of these laws, even if we successfully defend against it, could cause us to incur significant legal expenses, cause reputational harm and divert our management's attention from the operation of our business. Moreover, achieving and sustaining compliance with applicable federal and state laws may prove costly.

Because of the breadth of these laws and the narrowness of the safe harbors, it is possible that some of our business activities could be subject to challenge under one or more of such laws. The ACA also made several important changes to the federal anti-kickback statute, false claims laws, and healthcare fraud statute by weakening the intent requirement under the anti-kickback and healthcare fraud statutes that may make it easier for the government or

whistleblowers to charge such fraud and abuse violations. A person or entity no longer needs to have actual knowledge of this statute or specific intent to violate it. In addition, the ACA provides that the government may assert that a claim including items or services resulting from a violation of the federal anti-kickback statute constitutes a false or fraudulent claim for purposes of the false claims statutes. In addition, the ACA increases penalties for fraud and abuse violations. If our past, present or future operations are found to be in violation of any of the laws described above or other similar governmental regulations to which we are subject, we may be subject to significant civil, criminal and administrative penalties, damages, fines, imprisonment, exclusion from government funded healthcare programs, such as Medicare and Medicaid, and the curtailment or restructuring of our operations, any of which could adversely affect our ability to operate our business and negatively impact our financial results.

If Macrilen™ (macimorelin) does not gain market acceptance, we may be unable to generate significant revenues.

Market acceptance of Macrilen™ (macimorelin) depends on a number of factors, including, but not limited to:

- demonstration of clinical efficacy and safety;
- the prevalence and severity of any adverse side effects;
- limitations or warnings contained in the product's approved labeling;
- availability of alternative treatments for the indications we target;
- the advantages and disadvantages of Macrilen™ (macimorelin) relative to current or alternative treatments;
- the availability of acceptable pricing and adequate third-party reimbursement; and
- the effectiveness of marketing and distribution methods for Macrilen™ (macimorelin).

If Macrilen™ (macimorelin) does not gain market acceptance among physicians, patients, healthcare payers and others in the medical community, who may not accept or utilize Macrilen™ (macimorelin), our ability to generate significant revenues from Macrilen™ (macimorelin) would be limited, and our financial condition could be materially adversely affected. In addition, if we fail to further penetrate our core markets and existing geographic markets or to successfully expand our business into new markets, the growth in sales of Macrilen™ (macimorelin), along with our operating results, could be negatively impacted.

Our ability to further penetrate our core markets and existing geographic markets in which we compete or to successfully expand our business into additional countries in Europe, Asia or elsewhere is subject to numerous factors, many of which are beyond our control. Macrilen™ (macimorelin), if successfully commercialized, may compete with a number of drugs, therapies, products and tests currently manufactured and marketed by major pharmaceutical and other biotechnology companies. Macrilen™ (macimorelin) may also compete with new products currently under development by others or with products which may be less expensive than Macrilen™ (macimorelin). There can be no assurance that our efforts to increase market penetration in our core markets and existing geographic markets will be successful. Our failure to do so could have an adverse effect on our operating results and would likely cause a drop in the price of our Common Shares.

We may expend our limited resources to pursue a particular product or indication and fail to capitalize on other products or indications for which there may be a greater likelihood of success.

Because we have limited financial and managerial resources, we are currently focusing our efforts on Macrilen™ (macimorelin), and we are doing so for specific indications. As a result, we may forego or delay pursuit of opportunities for other potential indications for Macrilen™ (macimorelin) which there may be a greater likelihood of success or may prove to have greater commercial potential. Research programs to identify new product candidates or pursue alternative indications for Macrilen™ (macimorelin) require substantial technical, financial and human resources. These activities may initially show promise in identifying potential product candidates or indications, yet fail to yield product candidates or indications for further clinical development.

We may not achieve our projected development goals in the time-frames we announce and expect.

We may set goals and make public statements regarding the timing of the accomplishment of objectives material to our success, such as the commencement, enrollment and anticipated completion of clinical trials, anticipated regulatory submission and approval dates and time of product launch. The actual timing of these events can vary dramatically due to factors such as delays or failures in any clinical trials, the uncertainties inherent in the regulatory approval process and delays in achieving manufacturing or marketing arrangements sufficient to commercialize Macrilen™ (macimorelin). There can be no assurance that we will make regulatory submissions or receive regulatory approvals as planned or that we will be able to adhere to our schedule for launching of Macrilen™ (macimorelin) outside of the U.S. If we fail to achieve one or more of these milestones as planned, the price of our Common Shares would likely decline.

If we fail to obtain acceptable prices or adequate reimbursement for Macrilen™ (macimorelin), our ability to generate revenues will be diminished.

Our ability or that of our licensee(s) to successfully commercialize Macrilen™ (macimorelin) will depend significantly on our or their ability to obtain acceptable prices and the availability of reimbursement to the patient from third-party payers, such as governmental and private insurance plans. These third-party payers frequently require companies to provide predetermined discounts from list prices, and they are increasingly challenging the prices charged for pharmaceuticals and other medical products. Macrilen™ (macimorelin) may not be considered cost-effective, and reimbursement to the patient may not be available or sufficient to allow us or our licensee(s) to sell our products on a competitive basis. It may not be possible to negotiate favorable reimbursement rates for Macrilen™ (macimorelin). Adverse pricing and reimbursement conditions would also likely diminish our ability to induce third parties to in-license Macrilen™ (macimorelin).

In addition, the continuing efforts of third-party payers to contain or reduce the costs of healthcare through various means may limit our commercial opportunity and reduce any associated revenue and profits. We expect that proposals to implement similar government controls will continue. The pricing of pharmaceutical products, in general, and specialty drugs, in particular, has been a topic of concern in the U.S. Congress, where hearings on the topic have been held, and has been a topic of speeches given by political figures, including President Donald Trump. Specifically, there have been several recent U.S. Congressional inquiries and proposed bills designed to, among other things, bring more transparency to drug pricing, review the relationship between pricing and manufacturer patient programs, and reform government program reimbursement methodologies for drugs. Additionally, there is drug pricing reform taking place at the state level in the U.S., in the form of laws and bills, that will impact how pharmaceutical companies can market and sell drug products and at what price. Further, third-party payers are increasingly challenging the price, examining the medical necessity and reviewing the cost-effectiveness of medical drug products and medical services, in addition to questioning their safety and efficacy. There can be no assurance as to how this scrutiny on pricing of pharmaceutical products will impact future pricing of a product or orphan drugs or pharmaceutical products generally. In addition, increasing emphasis on managed care will continue to put pressure on the pricing of pharmaceutical and biopharmaceutical products. Cost control initiatives could decrease the price that we or any current or potential collaborators could receive a product and could adversely affect our profitability. In addition, in the U.S., Canada and many other countries, pricing and/or profitability of some or all prescription pharmaceuticals and biopharmaceuticals are subject to government control.

If we or our licensee(s) fail to obtain acceptable prices or an adequate level of reimbursement for Macrilen™ (macimorelin), the sales of Macrilen™ (macimorelin) would be adversely affected or there may be no commercially viable market for Macrilen™ (macimorelin).

Competition in our targeted markets is intense, and development by other companies could render Macrilen™ (macimorelin) non-competitive.

The biopharmaceutical field is highly competitive. New products developed by other companies in the industry could render Macrilen™ (macimorelin) uncompetitive. Competitors are developing and testing products and technologies that would compete with Macrilen™ (macimorelin). Some of these products may be more effective or have an entirely different approach or means of accomplishing the desired effect than Macrilen™ (macimorelin). We expect competition from pharmaceutical and biopharmaceutical companies and academic research institutions to continue to increase over time. Many of our competitors and potential competitors have substantially greater product development capabilities and financial, scientific, marketing and human resources than we do.

We may not obtain adequate protection for Macrilen™ (macimorelin) through our intellectual property.

We rely heavily on our proprietary information in developing and manufacturing Macrilen™ (macimorelin). Our success depends, in large part, on our ability to protect our competitive position through patents, trade secrets, trademarks and other intellectual property rights. We have filed and are pursuing applications for patents and trademarks in many countries. Pending patent applications may not result in the issuance of patents and we may not be able to obtain additional issued patents relating to Macrilen™ (macimorelin).

The laws of some countries do not protect intellectual property rights to the same extent as the laws of the U.S. and Canada. Many companies have encountered significant problems in protecting and defending such rights in foreign jurisdictions. Many countries, including certain countries in Europe, have compulsory licensing laws under which a patent owner may be compelled to grant licenses to third parties. In addition, many countries limit the enforceability

of patents against government agencies or government contractors. In these countries, the patent owner may have limited remedies, which could materially diminish the value of the patent. Moreover, the legal systems of certain countries, particularly certain developing countries, do not favor the aggressive enforcement of patent and other intellectual property protection, which makes it difficult to stop and prevent infringement.

Our patents may be challenged, narrowed, invalidated, held to be unenforceable or circumvented, which could limit our ability to stop competitors from marketing similar products or limit the length of term of patent protection we may have for Macrilen™ (macimorelin). Changes in either patent laws or in interpretations of patent laws in the U.S. and other countries may diminish the value of our intellectual property or narrow the scope of our patent protection for Macrilen™ (macimorelin). The patents issued

or to be issued to us for Macrilen™ (macimorelin) may not provide us with any competitive advantage or protect us against competitors with similar technology. In addition, it is possible that third parties with products that are very similar to ours will circumvent our patents by means of alternate designs or processes. We may have to rely on method-of-use, methods of manufacture and/or new-formulation protection for our compounds in development, and any resulting products, which may not confer the same protection as claims to compounds per se.

In addition, our patents may be challenged by third parties in patent litigation, which is becoming widespread in the biopharmaceutical industry. There may be prior art of which we are not aware that may affect the validity or enforceability of a patent claim. There may also be prior art of which we are aware, but which we do not believe affects the validity or enforceability of a claim, which may, nonetheless, ultimately be found to affect the validity or enforceability of a claim. No assurance can be given that our patents would, if challenged, be held by a court to be valid or enforceable or that a competitor's technology or product would be found by a court to infringe our patents. Our granted patents could also be challenged and revoked in U.S. post-grant proceedings as well as in opposition or nullity proceedings in certain countries outside the U.S. In addition, we may be required to disclaim part of the term of certain patents. The costs of these proceedings could be substantial, and it is possible that our efforts could be unsuccessful, resulting in a loss of our U.S. patent position.

We also rely on trade secrets and proprietary know-how to protect our intellectual property. If we are unable to protect the confidentiality of our proprietary information and know-how, the value of our technology and products could be adversely affected. We seek to protect our unpatented proprietary information in part by requiring our employees, consultants, outside scientific collaborators and sponsored researchers and other advisors to enter into confidentiality agreements. These agreements provide that all confidential information developed or made known to the individual during the course of the individual's relationship with us is to be kept confidential and not disclosed to third parties except in specific circumstances. In the case of our employees, the agreements provide that all of the technology that is conceived by the individual during the course of employment is our exclusive property. These agreements may not provide meaningful protection or adequate remedies in the event of unauthorized use or disclosure of our proprietary information. In addition, it is possible that third parties could independently develop proprietary information and techniques substantially similar to ours or otherwise gain access to our trade secrets. If we are unable to protect the confidentiality of our proprietary information and know-how, competitors may be able to use this information to develop products that compete with our products and technologies, which could adversely impact our business.

We currently have the right to use certain patents and technologies under license agreements with third parties. Our failure to comply with the requirements of one or more of our license agreements could result in the termination of such agreements, which could cause us to terminate the related development program and cause a complete loss of our investment in that program. Inventions claimed in certain in-licensed patents may have been made with funding from the U.S. government and may be subject to the rights of the U.S. government and we may be subject to additional requirements in the event we seek to commercialize or manufacture product candidates incorporating such in-licensed technology.

As a result of the foregoing factors, we may not be able to rely on our intellectual property to protect Macrilen™ (macimorelin) in the marketplace.

We may infringe the intellectual property rights of others.

Our commercial success depends significantly on our ability to operate without infringing the patents and other intellectual property rights of third parties. There could be issued patents of which we are not aware that our products or methods may be found to infringe, or patents of which we are aware and believe we do not infringe but which we may ultimately be found to infringe. Moreover, patent applications and their underlying discoveries are in some cases maintained in secrecy until patents are issued. Because patents can take many years to issue, there may be currently pending applications of which we are unaware that may later result in issued patents that our products or technologies are found to infringe. Moreover, there may be published pending applications that do not currently include a claim covering our products or technologies but which nonetheless provide support for a later drafted claim that, if issued, our products or technologies could be found to infringe.

If we infringe or are alleged to infringe intellectual property rights of third parties, it will adversely affect our business. Third parties may own or control these patents or patent applications in the U.S. and abroad. These third

parties could bring claims against us or our collaborators that would cause us to incur substantial expenses and, if successful against us, could cause us to pay substantial damages. Further, if a patent infringement suit were brought against us or our collaborators, we or they could be forced to stop or delay research, development, manufacturing or sales of the product or product candidate that is the subject of the suit.

The biopharmaceutical industry has produced a proliferation of patents, and it is not always clear to industry participants, including us, which patents cover various types of products. The coverage of patents is subject to interpretation by the courts, and the interpretation is not always uniform. In the event of infringement or violation of another party's patent or other intellectual property

rights, we may not be able to enter into licensing arrangements or make other arrangements at a reasonable cost. Any inability to secure licenses or alternative technology could result in delays in the introduction of our products or lead to prohibition of the manufacture or sale of products by us or our partners and collaborators.

Patent litigation is costly and time consuming and may subject us to liabilities.

If we become involved in any patent litigation, interference, opposition, re-examination or other administrative proceedings we will likely incur substantial expenses in connection therewith, and the efforts of our technical and management personnel will be significantly diverted. In addition, an adverse determination in litigation could subject us to significant liabilities.

We may not obtain trademark registrations for our current or future products.

We have filed applications for trademark registrations, including Macrilen™ (macimorelin), in various jurisdictions, including the U.S. We may file applications for other possible trademarks for Macrilen™ (macimorelin). No assurance can be given that any of our trademarks will be registered elsewhere, or that the use of any registered or unregistered trademarks will confer a competitive advantage in the marketplace.

We rely on third parties to conduct, supervise and monitor our clinical trials, and those third parties may not perform satisfactorily.

We rely on third parties such as contract resource organizations, medical institutions and clinical investigators to enroll qualified patients and to conduct, supervise and monitor our clinical trials. Our reliance on these third parties for clinical development activities reduces our control over these activities. Our reliance on these third parties, however, does not relieve us of our regulatory responsibilities, including ensuring that our clinical trials are conducted in accordance with Good Clinical Practice guidelines and the investigational plan and protocols contained in an Investigational New Drug application to the FDA, or a comparable foreign regulatory submission. Furthermore, these third parties may also have relationships with other entities, some of which may be our competitors. In addition, they may not complete activities on schedule, or may not conduct our preclinical studies or clinical trials in accordance with regulatory requirements or our trial design. If these third parties do not successfully carry out their contractual duties or meet expected deadlines, our efforts to obtain regulatory approvals for, and to commercialize, our products may be delayed or prevented.

In carrying out our operations, we are dependent on a stable and consistent supply of ingredients and raw materials. There can be no assurance that we, our contract manufacturers or our licensees, will be able, in the future, to continue to purchase products from our current suppliers or any other supplier on terms that are favorable or similar to current terms or at all. An interruption in the availability of certain raw materials or ingredients, or significant increases in the prices we pay for them, could have a material adverse effect on our business, financial condition, liquidity and operating results.

The failure to perform satisfactorily by third parties upon which we expect to rely to manufacture and supply products may lead to supply shortfalls.

We rely on third parties to manufacture and supply Macrilen™ (macimorelin). We also have or may have certain supply obligations vis-à-vis our existing and potential licensees, who are or will be responsible for the marketing of Macrilen™ (macimorelin). To be successful, Macrilen™ (macimorelin) has to be manufactured in commercial quantities in compliance with quality controls and regulatory requirements. Even though it is our objective to minimize such risk by introducing alternative suppliers to ensure a constant supply at all times, there are a limited number of contract manufacturers or suppliers that are capable of manufacturing Macrilen™ (macimorelin) or the materials used in its manufacture. If we are unable to do so ourselves or to arrange for third-party manufacturing or supply of Macrilen™ (macimorelin) or materials, or to do so on commercially reasonable terms, we may not be able to commercialize Macrilen™ (macimorelin) through our licensees. Reliance on third-party manufacturers entails risks to which we would not be subject if we manufactured products ourselves, including reliance on the third party for regulatory compliance, the possibility of breach of the manufacturing agreement by the third party because of factors beyond our control, and the possibility of termination or non-renewal of the agreement by the third party, based on its own business priorities, at a time that is costly or inconvenient for us.

We are subject to intense competition for our skilled personnel, and the loss of key personnel or the inability to attract additional personnel could impair our ability to conduct our operations.

We are highly dependent on our management and our clinical, regulatory and scientific staff, the loss of whose services might adversely impact our ability to achieve our objectives. Recruiting and retaining qualified management and clinical, scientific and regulatory personnel is critical to our success. Reductions in our staffing levels have eliminated redundancies in key capabilities and skill sets among our full-time staff and required us to rely more heavily on outside consultants and third parties. We have been unable to increase the compensation of our associates to the extent required to remain fully competitive for their services, which

increased our employee retention risk. The competition for qualified personnel in the biopharmaceutical field is intense, and if we are not able to continue to retain qualified personnel and/or maintain positive relationships with our outside consultants, we may not be able to achieve our strategic and operational objectives.

We are currently subject to a securities class-action litigation matter and we may be subject to similar or other litigation in the future.

The Company and certain of our current and former officers are defendants in a class-action lawsuit pending in the U.S. District Court for the District of New Jersey, brought on behalf of shareholders of the Company. The lawsuit alleges violations of the Securities Exchange Act of 1934 in connection with allegedly false and misleading statements made by the defendants between August 30, 2011 and November 6, 2014 (the "Class Period"), regarding the safety and efficacy of Macrilen™ (macimorelin), and the prospects for the approval of the Company's New Drug Application for the product by the FDA. The plaintiffs represent a class comprised of purchasers of the Company's common shares during the Class Period and seek damages, costs and expenses and such other relief as determined by the Court. The Company considers the claims that have been asserted in the lawsuit to be without merit and is vigorously defending against them. The Company cannot, however, predict at this time the outcome or potential losses, if any, with respect to this lawsuit.

Furthermore, we may, from time to time, be a party to other litigation in the normal course of business. Monitoring and defending against legal actions, whether meritorious, is time-consuming for our management and detracts from our ability to fully focus our internal resources on our business activities. In addition, legal fees and costs incurred in connection with such activities may be significant and we could, in the future, be subject to judgments or enter into settlements of claims for significant monetary damages. A decision adverse to our interests could result in the payment of substantial damages and could have a material adverse effect on our cash flow, results of operations and financial position.

With respect to any litigation, our insurance may not reimburse us or may not be sufficient to reimburse us for the expenses or losses we may suffer in contesting and concluding such lawsuit. Substantial litigation costs, including the substantial self-insured retention that we are required to satisfy before any insurance applies to a claim, unreimbursed legal fees or an adverse result in any litigation may adversely impact our business, operating results or financial condition. We believe that our directors' and officers' liability insurance will cover our potential liability with respect to the securities class-action lawsuit; however, the insurer has reserved its rights to contest the applicability of the insurance to such claims and the limits of the insurance may be insufficient to cover our eventual liability.

We are subject to the risk of product liability claims, for which we may not have or may not be able to obtain adequate insurance coverage.

The sale and use of Macrilen™ (macimorelin) will involve the risk of product liability claims and associated adverse publicity. Product liability claims might be made against us directly by patients, healthcare providers or pharmaceutical companies or others selling, buying or using our products. We attempt to manage our liability risks by means of insurance. We maintain insurance covering our liability for our preclinical and clinical studies as well as products liability insurance. However, we may not have or be able to obtain or maintain sufficient and affordable insurance coverage, including coverage for potentially very significant legal expenses, and without sufficient coverage any claim brought against us could have a materially adverse effect on our business, financial condition or results of operations.

We are a holding company, and claims of creditors of our subsidiaries will generally have priority as to the assets of such subsidiaries over our claims and those of our creditors and shareholders. In addition, our principal operating subsidiary, AEZS Germany, may become subject to insolvency proceedings if it is illiquid or “over-indebted” in accordance with German law.

Aeterna Zentaris Inc. is a holding company and a substantial portion of our non-cash assets is the share capital of our subsidiaries. AEZS Germany, our principal operating subsidiary, based in Frankfurt, Germany, holds most of our intellectual property rights. Because Aeterna Zentaris Inc. is a holding company, our obligations to our creditors are structurally subordinated to all existing and future liabilities of our subsidiaries, which may incur additional or other liabilities and/or obligations. Therefore, our rights and the rights of our creditors to participate in any distribution of the assets of any subsidiary in the event that such subsidiary were to be liquidated or reorganized or in the event of

any bankruptcy or insolvency proceeding relating to or involving such subsidiary, and therefore the rights of the holders of our Common Shares to participate in those assets, are subject to the prior claims of such subsidiary's creditors. To the extent that we may be a creditor with recognized claims against any such subsidiary, our claims would still be subject to the prior claims of our subsidiary's creditors to the extent that they are secured or senior to those held by us.

Holders of our Common Shares are not creditors of our subsidiaries. Claims to the assets of our subsidiaries will derive from our own ownership interest in those operating subsidiaries. Claims of our subsidiaries' creditors will generally have priority as to the assets of such subsidiaries over our own ownership interest claims and will therefore have priority over the holders of our Common

Shares. Our subsidiaries' creditors may from time to time include general creditors, trade creditors, employees, secured creditors, taxing authorities, and creditors holding guarantees. Accordingly, in the event of any foreclosure, dissolution, winding-up, liquidation or reorganization, or a bankruptcy, insolvency or creditor protection proceeding relating to us or our property, or any subsidiary, there can be no assurance as to the value, if any, that would be available to holders of our Common Shares. In addition, any distributions to us by our subsidiaries could be subject to monetary transfer restrictions in the jurisdictions in which our subsidiaries operate.

German law, which governs our principal operating subsidiary, AEZS Germany imposes an obligation on the managing director of AEZS Germany to institute insolvency proceedings of that subsidiary if the managing director concludes that AEZS Germany is insolvent because it is either illiquid or "over-indebted" in accordance with the provisions of German law.

It may be difficult for U.S. investors to obtain and enforce judgments against us because of our Canadian incorporation and German presence.

We are a company existing under the laws of Canada. A number of our directors and officers are residents of Canada or otherwise reside outside the U.S., and all or a substantial portion of their assets, and a substantial portion of our assets, are located outside the U.S. Consequently, although we have appointed an agent for service of process in the U.S., it may be difficult for investors in the U.S. to bring an action against such directors or officers or to enforce against those persons or us a judgment obtained in a U.S. court predicated upon the civil liability provisions of federal securities laws or other laws of the U.S. Investors should not assume that foreign courts (i) would enforce judgments of U.S. courts obtained in actions against us or such directors, officers or experts predicated upon the civil liability provisions of the U.S. federal securities laws or the securities or "blue sky" laws of any state within the U.S. or (ii) would enforce, in original actions, liabilities against us or such directors, officers or experts predicated upon the U.S. federal securities laws or any such state securities or "blue sky" laws.

We are subject to various internal control reporting requirements under applicable Canadian securities laws and the Sarbanes-Oxley Act in the U.S. We can provide no assurance that we will at all times in the future be able to report that our internal controls over financial reporting are effective.

As a public company, we are required to comply with Section 404 of the U.S. Sarbanes-Oxley Act ("Section 404") and National Instrument 52-109 - Certification of Disclosure in Issuers' Annual and Interim Filings of the Canadian securities administrators. In any given year, we cannot be certain as to the time of completion of our internal control evaluation, testing and remediation actions or of their impact on our operations. Upon completion of this process, we may identify control deficiencies of varying degrees of severity under applicable SEC and Public Company Accounting Oversight Board (U.S.) rules and regulations. As a public company, we are required to report, among other things, control deficiencies that constitute material weaknesses or changes in internal controls that, or that are reasonably likely to, materially affect internal controls over financial reporting. A "material weakness" is a deficiency, or a combination of deficiencies, in internal control over financial reporting, such that there is a reasonable possibility that a material misstatement of our annual consolidated financial statements will not be prevented or detected on a timely basis. If we fail to comply with the requirements of Section 404 or similar Canadian requirements or if we report a material weakness, we might be subject to regulatory sanction and investors may lose confidence in our consolidated financial statements, which may be inaccurate if we fail to remedy such material weakness.

It is possible that we may be a passive foreign investment company, which could result in adverse tax consequences to U.S. investors.

Adverse U.S. federal income tax rules apply to "U.S. Holders" (as defined in "Item 10.E - Taxation - Material U.S. Federal Income Tax Considerations" in this Annual Report on Form 20-F) who directly or indirectly hold Common Shares of a passive foreign investment company ("PFIC"). We will be classified as a PFIC for U.S. federal income tax purposes for a taxable year if (i) at least 75% of our gross income is "passive income" or (ii) at least 50% of the average value of our assets, including goodwill (based on annual quarterly average), is attributable to assets which produce passive income or are held for the production of passive income.

We believe that we were a PFIC for the 2015 taxable year, but were not a PFIC for the 2016, 2017 and 2018 taxable years. However, the PFIC determination depends on the application of complex U.S. federal income tax rules concerning the classification of our assets and income for this purpose, and these rules are uncertain in some respects.

In addition, the fair market value of our assets may be determined in large part by the market price of our Common Shares, which is likely to fluctuate, and the composition of our income and assets will be affected by how, and how quickly, we spend any cash that is raised in any financing transaction. No assurance can be provided that we will not be classified as a PFIC for the 2018 taxable year and for any future taxable year.

If we are a PFIC for any taxable year during which a U.S. Holder holds Common Shares, we generally would continue to be treated as a PFIC with respect to that U.S. Holder for all succeeding years during which the U.S. Holder holds such Common Shares, even if we ceased to meet the threshold requirements for PFIC status. PFIC characterization could result in adverse U.S. federal income tax consequences to U.S. Holders. In particular, absent certain elections, a U.S. Holder would generally be subject to U.S. federal income tax at ordinary income tax rates, plus a possible interest charge, in respect of a gain derived from a disposition of our Common Shares, as well as certain distributions by us. If we are treated as a PFIC for any taxable year, a U.S. Holder may be able to make an election to "mark to market" Common Shares each taxable year and recognize ordinary income pursuant to such election based upon increases in the value of the Common Shares. In addition, U.S. Holders may mitigate the adverse tax consequences of the PFIC rules by making a "qualified electing fund" ("QEF") election; however, there can be no assurance that the Company will satisfy the record keeping requirements applicable to a QEF or that it will provide the information regarding its income that would be necessary for a U.S. Holder to make a QEF election.

If the Company is a PFIC, U.S. Holders will generally be required to file an annual information return with the Internal Revenue Service (the "IRS") (on IRS Form 8621, which PFIC shareholders will be required to file with their U.S. federal income tax or information returns) relating to their ownership of Common Shares. This filing requirement is in addition to any pre-existing reporting requirements that apply to a U.S. Holder's interest in a PFIC (which this requirement does not affect).

For a more detailed discussion of the potential tax impact of us being a PFIC, see "Item 10.E - Taxation - Material U.S. Federal Income Tax Considerations" in this Annual Report on Form 20-F. The PFIC rules are complex. U.S. Holders should consult their tax advisors regarding the potential application of the PFIC regime and any reporting obligations to which they may be subject under that regime.

Our net operating losses may be limited for U.S. federal income tax purposes under Section 382 of the Internal Revenue Code.

If a corporation with net operating losses ("NOLs") undergoes an "ownership change" within the meaning of Section 382 of the United States Internal Revenue Code of 1986, as amended, then such corporation's use of such "pre-change" NOLs to offset income incurred following such ownership change may be limited. Such limitation also may apply to certain losses or deductions that are "built-in" (i.e., attributable to periods prior to the ownership change but not yet taken into account for tax purposes) as of the date of the ownership change that are subsequently recognized. An ownership change generally occurs when there is either (i) a shift in ownership involving one or more "5% shareholders"; or (ii) an "equity structure shift" and, as a result, the percentage of stock of the corporation owned by one or more 5% shareholders (based on value) has increased by more than 50 percentage points over the lowest percentage of stock of the corporation owned by such shareholders during the "testing period" (generally the 3 years preceding the testing date). In general, if such change occurs, the corporation's ability to utilize its net operating loss carry-forwards and certain other tax attributes would be subject to an annual limitation, as described below. The unused portion of any such net operating loss carry-forwards or tax attributes each year is carried forward, subject to the same limitation in future years. The impact of an ownership change on state NOL carryforwards may vary from state to state. Recent legislation added several limitations to the ability to claim deductions for NOLs, including a deduction limit equal to 80% of taxable income and a restriction on NOL carryback deductions.

We may incur losses associated with foreign currency fluctuations.

Our operations are in many instances conducted in currencies other than our functional currency or the functional currencies of our subsidiaries. Fluctuations in the value of currencies could cause us to incur currency exchange losses. We do not currently employ a hedging strategy against exchange rate risk. We cannot assert with any assurance that we will not suffer losses as a result of unfavorable fluctuations in the exchange rates between the U.S. dollar, the euro, the Canadian dollar and other currencies.

Legislative actions, new accounting pronouncements and higher insurance costs may adversely impact our future financial position or results of operations.

Changes in financial accounting standards or implementation of accounting standards may cause adverse, unexpected revenue or expense fluctuations and affect our financial position or results of operations. New pronouncements and varying interpretations of pronouncements have occurred with greater frequency and are expected to occur in the

future, and we may make or be required to make changes in our accounting policies in the future. Compliance with changing regulations of corporate governance and public disclosure, notably with respect to internal controls over financial reporting, may result in additional expenses. Changing laws, regulations and standards relating to corporate governance and public disclosure are creating uncertainty for companies such as ours, and insurance costs are increasing as a result of this uncertainty.

Data security breaches may disrupt our operations and adversely affect our operating results.

Our network security and data recovery measures and those of third parties with which we contract, may not be adequate to protect against computer viruses, cyber-attacks, breaches, and similar disruptions from unauthorized tampering with our computer systems. The misappropriation, theft, sabotage or any other type of security breach with respect to any of our proprietary and confidential information that is electronically stored, including research or clinical data, could cause interruptions in our operations, could result in a material disruption of our clinical activities and business operations and could expose us to third-party legal claims. Furthermore, we could be required to make substantial expenditures of resources to remedy the cause of cyber-attacks or break-ins. This disruption could have a material adverse impact on our business, operating results and financial condition. Additionally, any break-in or trespass of our facilities that results in the misappropriation, theft, sabotage or any other type of security breach with respect to our proprietary and confidential information, including research or clinical data, or that results in damage to our R&D equipment and assets could have a material adverse impact on our business, operating results, and financial condition.

Our business processes personal information, both in connection with clinical activities and our employees. The use of this information is critical to our operations and innovation, including the development of our products, as well as management of our employees. New and evolving regulations, such as the European Union General Data Protection Regulation, could bring increased scrutiny of our data management in the future. Any cyber-attacks or other failure to protect critical and sensitive systems and information could damage our reputation, prompt litigation or lead to regulatory sanctions, all of which could materially affect our financial condition and results of operation.

Risks Relating to our Common Shares

Our Common Shares may be delisted from NASDAQ or TSX, which could affect their market price and liquidity. If our Common Shares were to be delisted, investors may have difficulty in disposing of their shares.

Our Common Shares are currently listed on both NASDAQ and TSX under the symbol "AEZS". We must meet continuing listing requirements to maintain the listing of our Common Shares on NASDAQ and TSX. For continued listing, NASDAQ requires, among other things, that listed securities maintain a minimum closing bid price of not less than $1.00 per share. There can be no assurance that the market price of our Common Shares will not fall below $1.00 in the future or that, if it does, we will regain compliance with the minimum bid price requirement.

In addition to the minimum bid price requirement, the continued listing rules of NASDAQ require us to meet at least one of the following listing standards: (i) stockholders' equity of at least $2.5 million, (ii) market value of listed securities (calculated by multiplying the daily closing bid price of our Common Shares by our total outstanding Common Shares) of at least $35 million or (iii) net income from continuing operations (in the latest fiscal year or in two of the last three fiscal years) of at least $500,000 (collectively, the "Additional Listing Standards"). If we fail to meet at least one of the Additional Listing Standards, our Common Shares may be subject to delisting after the expiration of the period of time, if any, that we are allowed for regaining compliance.

There can be no assurance that our Common Shares will remain listed on NASDAQ or TSX. If we fail to meet any of NASDAQ's or TSX's continued listing requirements, our Common Shares may be delisted. Any delisting of our Common Shares may adversely affect a shareholder's ability to dispose, or obtain quotations as to the market value, of such shares.

Our share price is volatile, which may result from factors outside of our control.

Our valuation and share price since the beginning of trading after our initial listings, first in Canada and then in the U.S., have had no meaningful relationship to current or historical financial results, asset values, book value or many other criteria based on conventional measures of the value of shares.

Between January 1, 2018 and December 31, 2018, the closing price of our Common Shares ranged from $1.19 to $3.87 per share on NASDAQ and from C$1.53 to C$5.10 per share on TSX. Our share price may be affected by developments directly affecting our business and by developments out of our control or unrelated to us. The stock market generally, and the biopharmaceutical sector in particular, are vulnerable to abrupt changes in investor sentiment. Prices of shares and trading volume of companies in the biopharmaceutical industry can swing dramatically in ways unrelated to, or that bear a disproportionate relationship to, operating performance. Our share price and trading volume may fluctuate based on a number of factors including, but not limited to:

- developments regarding current or future third-party suppliers and licensee(s);

- clinical and regulatory developments regarding Macrilen™ (macimorelin);
- delays in our anticipated clinical development or commercialization timelines;
- announcements by us regarding technological, regulatory or other matters;
- arrivals or departures of key personnel;

- governmental or regulatory action affecting our product candidates and our competitors' products in the U.S., Canada and other countries;
- developments or disputes concerning patent or proprietary rights;
- actual or anticipated fluctuations in our revenues or expenses;
- general market conditions and fluctuations for the emerging growth and biopharmaceutical market sectors; and
- economic conditions in the U.S. or abroad.

Our listing on both NASDAQ and TSX may increase price volatility due to various factors, including different ability to buy or sell our Common Shares, different market conditions in different capital markets and different trading volumes. In addition, low trading volume may increase the price volatility of our Common Shares. A thin trading market could cause the price of our Common Shares to fluctuate significantly more than the stock market as a whole.

We do not intend to pay dividends in the near future.

To date, we have not declared or paid any dividends on our Common Shares. As a result, the return on an investment in our Common Shares, or any of our other securities, will depend upon any future appreciation in value. There is no guarantee that our Common Shares or any of our other securities will appreciate in value or even maintain the price at which shareholders have purchased them.

Future issuances of securities and hedging activities may depress the trading price of our Common Shares.

Any additional or future issuance of Common Shares or Convertible Securities, including the issuance of Common Shares upon the exercise of stock options and upon the exercise of warrants or other Convertible Securities, could dilute the interests of our existing shareholders, and could substantially decrease the trading price of our Common Shares.

We may issue equity securities in the future for a number of reasons, including to finance our operations and business strategy, to satisfy our obligations upon the exercise of options or warrants or for other reasons. Our stock option plan generally permits us to have outstanding, at any given time, stock options that are exercisable for a maximum number of Common Shares equal to 11.4% of all then issued and outstanding Common Shares. As at December 31, 2018, there were:

- 16,440,760 Common Shares issued and outstanding;
- no issued and outstanding Preferred Shares;
- 115,844 Common Shares issuable upon exercise of warrants that we previously issued in March 2015, which had a weighted average exercise price as of December 31, 2018 of $1.07 per Common Share, 2,331,000 Common Shares issuable upon exercise of warrants that we previously issued in December 2015, which had a weighted average exercise price as of December 31, 2018 of $7.10 per Common Share, and 945,000 Common Shares issuable upon exercise of warrants that we previously issued in November 2016, which had a weighted average exercise price as of December 31, 2018 of $4.70 per Common Share;
- 888,816 Common Shares that underlie outstanding stock options and deferred share units granted under our Plans, having a weighted average exercise price of $3.66 per Common Share;
- 869 Common Shares that underlie outstanding stock options and deferred share units granted under our Plans, having a weighted average exercise price of C$743.56 per Common Share; and
- 246,619 additional Common Shares available for future grants under our Stock Option Plan, and 737,942 additional Common Shares available for future grants under our Long Term Incentive Plan. The maximum number of Common Shares issuable under the Plans may equal 11.4% of the issued and outstanding Common Shares at any given time.

In addition, the price of our Common Shares could also be affected by possible sales of Common Shares by investors who view other investment vehicles as more attractive means of equity participation in us and by hedging or arbitrage trading activity that may develop involving our Common Shares. This hedging or arbitrage could, in turn, affect the trading price of our Common Shares.

In the event we were to lose our foreign private issuer status as of June 30 of a given financial year, we would be required to comply with the Exchange Act's domestic reporting regime, which could cause us to incur additional legal, accounting and other expenses.

In order to maintain our current status as a foreign private issuer, either (1) a majority of our Common Shares must not be either directly or indirectly owned of record by residents of the U.S. or (2) (a) a majority of our executive officers and of our directors must not be U.S. citizens or residents, (b) more than 50 percent of our assets cannot be located in the U.S. and (c) our business must be administered principally outside the U.S.

In 2018, our management conducted its annual assessment of the various facts and circumstances underlying the determination of our status as a foreign private issuer and, based on the foregoing, our management has determined that, as of the date of such determination and as of June 30, 2018, we continued to be a foreign private issuer. There can be no assurance, however, that we will remain a foreign private issuer either in 2019 or in future financial years.

If we were to lose our foreign private issuer status as of June 30 of any given financial year, we would be required to comply with the Exchange Act reporting and other requirements applicable to U.S. domestic issuers, which are more detailed and extensive than the requirements for foreign private issuers. We may also be required to make changes in our corporate governance practices in accordance with various SEC rules and NASDAQ listing standards. The regulatory and compliance costs to us of complying with the reporting requirements applicable to a U.S. domestic issuer under U.S. securities laws may be higher than the cost we have historically incurred as a foreign private issuer. In addition, if we were to lose our foreign private issuer status, we would no longer qualify under the Canada-U.S. multijurisdictional disclosure system to benefit from being able to file registration statements on Form F-10 (even if we satisfy the other conditions to eligibility), which could make it longer and more difficult to register our securities and raise funds by way of public, registered offerings in the U.S., and we would become subject to "baby shelf" rules that place limitations on our ability to issue an amount of securities above a certain threshold depending on our market capitalization and public float at a given point in time. As a result, we would expect that a potential loss of foreign private issuer status at some future point in time could increase our legal, financial reporting and accounting compliance costs, and it is difficult at this time to estimate by how much our legal, financial reporting and accounting compliance costs may increase in such eventuality.

Our articles of incorporation contain "blank check" preferred share provisions, which could delay or impede an acquisition of our company.

Our articles of incorporation, as amended, authorize the issuance of an unlimited number of "blank check" preferred shares, which could be issued by our Board of Directors without shareholder approval and which may contain liquidation, dividend and other rights equivalent or superior to our Common Shares. In addition, we have implemented in our constating documents an advance notice procedure for shareholder approvals to be brought before an annual meeting of our shareholders, including proposed nominations of persons for election to our Board of Directors. These provisions, among others, whether alone or together, could delay or impede hostile takeovers and changes in control or changes in our management. Any provision of our constating documents that has the effect of delaying or deterring a change in control could limit the opportunity for our shareholders to receive a premium for their Common Shares and could also affect the price that some investors are willing to pay for our Common Shares.

Our business could be negatively affected as a result of the actions of activist shareholders.

Proxy contests have been waged against many companies in the biopharmaceutical industry over the last few years. If faced with a proxy contest, we may not be able to successfully respond to the contest, which would be disruptive to our business. Even if we are successful, our business could be adversely affected by a proxy contest because:

- responding to proxy contests and other actions by activist shareholders may be costly and time consuming, and may disrupt our operations and divert the attention of management and our employees;
- perceived uncertainties as to the potential outcome of any proxy contest may result in our inability to consummate potential acquisitions, collaborations or in licensing opportunities and may make it more difficult to attract and retain qualified personnel and business partners; and
- if individuals that have a specific agenda different from that of our management or other members of our Board of Directors are elected to our board as a result of any proxy contest, such an election may adversely affect our ability to effectively and timely implement our strategic plan and to create value for our shareholders.

Item 4. Information on the Company

A. History and development of the Company

We are a specialty biopharmaceutical company engaged in developing and commercializing pharmaceutical therapies, currently focused on the development and commercialization of Macrilen™ (macimorelin), including through out-licensing arrangements and pursuing in-licensing opportunities.

We were incorporated on September 12, 1990 under the Canada Business Corporations Act (the "CBCA") and continue to be governed by the CBCA. Our registered address is located at 1155 René-Lévesque Blvd, West 41st Floor, Montréal, Quebec, Canada H3B 3V2 c/o Stikeman Elliott, LLP. Our principal executive offices are located at 315 Sigma Drive, Summerville, South Carolina 29486; our telephone number is (843) 900-3223 and our website is www.zentaris.com. None of the documents or information found on our website shall be deemed to be included in or incorporated by reference into this Annual Report on Form 20-F, unless such document is specifically incorporated herein by reference. The SEC also maintains a website at www.sec.gov that contains reports, proxy statements and other information regarding registrants that file electronically with the SEC.

On December 30, 2002, we acquired Zentaris AG, a biopharmaceutical company based in Frankfurt, Germany. Zentaris was a spin-off of Asta Medica GmbH, a former pharmaceutical company affiliated with Degussa AG.

In May 2004, we changed our name to Aeterna Zentaris Inc. and on May 11, 2007, Zentaris GmbH was renamed Aeterna Zentaris GmbH ("AEZS Germany"). AEZS Germany conducts our drug development efforts. In September 2007, we incorporated Aeterna Zentaris, Inc. under the laws of Delaware. This wholly-owned subsidiary, which is based in the Charleston, South Carolina area, conducts certain of our administrative and commercial operations.

On November 17, 2015, we effected a 100-to-1 Share Consolidation (reverse stock split). Our Common Shares commenced trading on a consolidated and adjusted basis on both NASDAQ and TSX on November 20, 2015.

We currently have three wholly-owned direct and indirect subsidiaries, AEZS Germany, based in Frankfurt, Germany; Zentaris IVF GmbH, a direct wholly-owned subsidiary of AEZS Germany based in Frankfurt, Germany; and Aeterna Zentaris, Inc., an entity incorporated in the State of Delaware with an office in the Charleston, South Carolina area in the United States.

Our Common Shares are listed for trading on both NASDAQ and TSX under the trading symbol "AEZS".

Our agent for service of process and SEC matters in the United States is our wholly-owned subsidiary, Aeterna Zentaris, Inc., located at 315 Sigma Drive, Summerville, South Carolina 29486.

There have been no public takeover offers by third parties with respect to us or by us in respect of other companies' shares during the last or current financial year.

Recent Developments

For a complete description of our recent corporate and pipeline developments, refer to "Item 5. - Operating and Financial Review and Prospects - Key Developments".

B. Business overview

Our primary business strategy is to finalize the development, manufacturing, registration and commercialization of Macrilen™ (macimorelin) through the License and Assignment Agreement in the United States and Canada. We continue to explore various alternatives to monetize our rights to Macrilen™ (macimorelin) in other countries around the globe, including whether to find other license partners in these jurisdictions or to use our internal resources to commercialize Macrilen™ (macimorelin) in one or more of these countries. Our vision is to become a growth-oriented specialty biopharmaceutical company.

Macrilen™ (macimorelin)

Macrilen™ (macimorelin) is a novel orally available peptidomimetic ghrelin receptor agonist that stimulates the secretion of growth hormone by binding to the ghrelin receptor (GHSR-1a) and that has potential uses in both endocrinology and oncology indications. Macrilen™ (macimorelin) was granted orphan-drug designation by the FDA for use in evaluating growth hormone deficiency ("GHD").

Competitors for Macrilen™ (macimorelin) as a product for the evaluation of AGHD are principally the diagnostic tests currently performed by endocrinologists, although none of these tests are approved by the FDA for this purpose. The most commonly used diagnostic tests for GHD are:

- Measurement of blood levels of Insulin Growth Factor ("IGF")-1, which is typically used as the first test when GHD is suspected. However, this test is not used to definitively diagnose GHD because many growth hormone deficient patients show normal IGF-1 levels.
- The Insulin Tolerance Test ("ITT"), which has historically been considered the gold standard for the evaluation of AGHD because of its high sensitivity and specificity. However, the ITT is inconvenient to both patients and physicians, administered intravenously (IV), and contra-indicated in certain patients, such as patients with coronary heart disease or seizure disorder, because it requires the patient to experience hypoglycemia to obtain an accurate result. Some physicians will not induce full hypoglycemia, intentionally compromising accuracy to increase safety and comfort for the patient. Furthermore, administration of the ITT includes additional costs associated with the patient being closely monitored by a physician for the two- to four-hour duration of the test and the test must be administered in a setting where emergency equipment is available and where the patient may be quickly hospitalized. The ITT is not used for patients with co-morbidities, such as cardiovascular disease, seizure disorder or a history of brain cancer or for patients who are elderly and frail, due to safety concerns.
- The Glucagon Stimulation Test ("GST") is considered relatively safe by endocrinologists. The mechanism of action for this test is unclear. Also, this test takes up to three to four hours. It produces side effects in up to one-third of the patients with the most common being nausea during and after the test. This test is administered intramuscularly (IM).
- The GHRH + ARG test (growth hormone releasing hormone-arginine stimulation) which is an easier test to perform in an office setting and has a good safety profile but is considered to be costly to administer compared to the ITT and the GST. GHRH + ARG is approved in the EU and has been proposed to be the best alternative to ITT, but GHRH is no longer available in the United States. This test is administered intravenously (IV).

Oral administration of Macrilen™ (macimorelin) offers convenience and simplicity over the current GHD tests used, all of which require either intravenous or intramuscular administration. Additionally, Macrilen™ (macimorelin) may demonstrate a more favorable safety profile than existing diagnostic tests, some of which may be inappropriate for certain patient populations, e.g. diabetes mellitus or coronary heart disease, and have demonstrated a variety of side effects, which Macrilen™ (macimorelin) has not thus far. These factors may be limiting the use of GHD testing and may potentially enable Macrilen™ (macimorelin) to become the product of choice in evaluating AGHD. We believe that Macrilen™ (macimorelin) is likely to rapidly displace the ITT as the preferred means of evaluating AGHD for the following reasons:

- it is safer and more convenient than the ITT because it does not require the patient to become hypoglycemic;
- Macrilen™ (macimorelin) is administered orally, while the ITT requires an intravenous injection of insulin;
- Macrilen™ (macimorelin) is a more robust test than the ITT leading to evaluable test results;
- Macrilen™ (macimorelin) results are highly reproducible;
- the evaluation of AGHD using Macrilen™ (macimorelin) is less time-consuming and labor-intensive than the ITT; and

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- the evaluation can be conducted in the physician's office rather than in a hospital-like setting.

We believe that approximately 60,000 AGHD tests will be conducted annually, in the U.S, after the introduction of Macrilen™ (macimorelin). In addition, based on published information from the U.S. Centers for Disease Control and Prevention, different scientific publications and Navigant Research, we estimate that the total potential U.S. market for AGHD evaluation is approximately 150,000 tests per year, including the evaluation of patients who have suffered traumatic brain injury ("TBI"). In patients with TBI, GHD is frequent and may contribute to cognitive sequelae and reduction in quality of life. GHD may develop in approximately 19% of both severe and moderate hospitalized TBI victims.

Development History

The following is a summary of the history of our development of Macrilen™ (macimorelin):

2004 - 2014

- We out-licensed the development compound macimorelin acetate to Ardana Bioscience in 2004. Ardana Bioscience subsequently initiated the clinical development program of macimorelin acetate as an orally active compound intended to be used in the diagnosis of AGHD, however in 2008 Ardana Bioscience filed for bankruptcy so we terminated the license and regained rights to the compound. On October 19th, 2009, we announced that we would continue the macimorelin clinical development program for use in evaluating the AGHD and assumed the sponsorship of the Investigational New Drug Application (IND). On December 20, 2010, we announced we had reached agreement with the FDA on a Special Protocol Assessment ("SPA") for Macrilen™ (macimorelin), enabling us to complete the ongoing registration study required to gain approval for use in evaluating AGHD. On July 26, 2011, we announced the completion of the Phase 3 study of Macrilen™ (macimorelin) as a first oral product for use in evaluating AGHD and the decision to meet with the FDA for the future filing of an NDA for the registration of Macrilen™ (macimorelin) in the United States. On June 26, 2012, we announced that the final results from a Phase 3 trial for Macrilen™ (macimorelin) showed that the drug is safe and effective in evaluating AGHD. In November 2013, we filed an NDA for Macrilen™ (macimorelin) for the evaluation of AGHD by evaluating the pituitary gland secretion of growth hormone in response to an oral dose of the product. The FDA accepted the NDA for substantive review in January 2014. On November 6, 2014, the FDA informed us, by issuing a Complete Response Letter ("CRL"), that it had determined that our NDA could not be approved in its then present form. The CRL stated that the planned analysis of our pivotal trial did not meet its stated primary efficacy objective as agreed to in the SPA. The CRL further mentioned issues related to the lack of complete and verifiable source data for determining whether patients were accurately diagnosed with AGHD. The FDA concluded that, "in light of the failed primary analysis and data deficiencies noted, the clinical trial does not by itself support the indication." To address the deficiencies identified above, the CRL stated that we needed to demonstrate the efficacy of Macrilen™ (macimorelin) as a diagnostic test for GHD in a new, confirmatory clinical study. The CRL also stated that a serious event of electrocardiogram QT interval prolongation occurred for which attribution to drug could not be excluded. Therefore, a dedicated thorough QT study to evaluate the effect of macimorelin on the QT interval would be necessary for FDA clearance and approval.

2015 - present

- Following receipt of the CRL, we assembled a panel of experts in the field of growth-hormone deficiency, including experts in the field from both the United States and the EU. The panel met on January 8, 2015, during which we discussed our conclusions from the CRL, as well as the potential design of a new pivotal study. The panel advised us to continue to seek approval for Macrilen™ (macimorelin) because of their confidence in its efficacy and because there currently is no FDA-approved diagnostic test for AGHD. In parallel, we collected information on timelines and costs for such a study.

During an end-of-review meeting with the FDA on March 6, 2015, we agreed with the FDA on the general design of the confirmatory Phase 3 study of Macrilen™ (macimorelin) for the evaluation of AGHD, as well as evaluation criteria.

- We agreed with the FDA that the confirmatory study will be conducted as a two-way crossover with the ITT as the benchmark comparator.
- On April 13, 2015, we announced plans to conduct a new, confirmatory Phase 3 clinical study to demonstrate the efficacy of Macrilen™ (macimorelin) for the evaluation of AGHD, as well as a dedicated thorough QT study to evaluate the effect of Macrilen™ (macimorelin) on myocardial repolarization. The confirmatory Phase 3 clinical study of

Macrilen™ (macimorelin), entitled "Confirmatory validation of oral macimorelin as a growth hormone (GH) stimulation test (ST) for the diagnosis of AGHD in comparison with the insulin tolerance test (ITT)", was designed as a two-way crossover study with the ITT as the benchmark comparator and involved 31 sites in the United States and Europe. The study population was planned to include at least 110 subjects (at least 55 ITT-positive and 55 ITT-negative) with a medical history documenting risk factors for AGHD, and was planned to include a spectrum of subjects from those with a low risk of having AGHD to those with a high risk of having the condition.

- On May 26, 2015, we announced that we had received written scientific advice from the EMA regarding the further development plan, including the study design, for the new confirmatory Phase 3 clinical study of Macrilen™ (macimorelin) for use in evaluating AGHD. As a result of the advice, we believe that the confirmatory Phase 3 study that was agreed with the FDA meets the EMA's study-design expectations as well, allowing for U.S. and European approval, if the study is successful.
- On November 19, 2015, we announced the enrollment of the first patient in the confirmatory Phase 3 clinical study of Macrilen™ (macimorelin).
- On October 26, 2016, we announced completion of patient recruitment for the confirmatory Phase 3 clinical trial of Macrilen™ (macimorelin) as a growth hormone stimulation test for the evaluation of AGHD. In addition, we completed the dedicated QT study as requested by the FDA in the CRL to evaluate the effect of Macrilen™ (macimorelin) on the QT interval.
- On January 4, 2017, we announced that, based on an analysis of top-line data, the confirmatory Phase 3 clinical trial of Macrilen™ (macimorelin) failed to achieve one of its co-primary endpoints. Under the study protocol, the evaluation of AGHD with Macrilen™ (macimorelin) would be considered successful, if the lower bound of the two-sided 95% confidence interval for the primary efficacy variables was 75% or higher for "percent negative agreement" with the ITT, and 70% or higher for the "percent positive agreement" with the ITT. While the estimated percent negative agreement met the success criteria, the estimated percent positive agreement did not reach the criteria for a successful outcome. Therefore, the results did not meet the pre-defined equivalence criteria which required success for both the percent negative agreement and the percent positive agreement.
- On February 13, 2017, we announced that, after reviewing the raw data on which the top-line data were based, we had concluded that Macrilen™ (macimorelin) had demonstrated performance supportive of achieving FDA registration and that we intended to pursue registration. The announcement set forth the facts on which our conclusion was based. The Company met with the FDA at the end of March 2017 to discuss this position.
- On March 7, 2017, we announced that the Pediatric Committee ("PDCO") EMA agreed to the Company's Pediatric Investigation Plan ("PIP") for Macrilen™ (macimorelin) and agreed that the Company may defer conducting the PIP until after it files a Marketing Authorization Application ("MAA") seeking marketing authorization for the use of Macrilen™ (macimorelin) for the evaluation of AGHD.
- On July 18, 2017, we were provided a PDUFA date of December 30, 2017 by the FDA.
- On November 27, 2017, the EMA accepted our MMA submission for Macrilen™ (macimorelin).
- On December 20, 2017, the FDA approved the market authorization for Macrilen™ (macimorelin), to be used in the diagnosis of patients with adult growth hormone deficiency (AGHD).
- On January 16, 2018, the Company, through AEZS Germany, entered into the License and Assignment Agreement to carry out development, manufacturing, registration, regulatory and supply chain services for the commercialization of Macrilen™ (macimorelin) in the U.S. and Canada as further described below.
- In the August 2018, Volume 103, Issue 8 edition of The Journal of Clinical Endocrinology and Metabolism, the pivotal Phase 3 data from the macimorelin confirmatory trial was published by Jose M. Garcia, MD, PhD, et al., titled ‘Macimorelin as a Diagnostic Test for Adult GH Deficiency’.
- On November 19, 2018, we announced the Committee for Medicinal Products for Human Use (CHMP) of the European Medicines Agency (EMA) adopted a positive opinion recommending a marketing authorization for macimorelin.
- On January 16, 2019, the Company announced that the EMA has granted marketing authorization for macimorelin.

Macrilen™ (macimorelin) License and Assignment Agreement

On January 16, 2018, the Company, through AEZS Germany, entered into the License and Assignment Agreement with Strongbridge Ireland Limited ("Strongbridge") to carry out development, manufacturing, registration, regulatory and supply chain services for the commercialization of Macrilen™ (macimorelin) in the U.S. and Canada. This agreement provides (i) for the "right to use" license relating to the Adult Indication; (ii) for the right to acquire a license for the Pediatric Indication if and when the FDA approves a pediatric indication; (iii) that the licensee is to fund 70% of the costs of a pediatric clinical trial submitted for approval to the EMA and FDA (the "PIP") to be run by the Company with customary oversight from a joint steering committee (the "JSC"); and (iv) the Interim Supply

Arrangement.

Effective December 19, 2018, Strongbridge sold the United States and Canadian rights to Macrilen™ (macimorelin) under the License and Assignment Agreement to Novo for a payment plus tiered royalties on net sales and Novo will fund Strongbridge's Macrilen™(macimorelin) field organization as a contract field force to promote the product in the United States for up to three years.

(i) Adult Indication

Under the terms of the License and Assignment Agreement, and for as long as Macrilen™ (macimorelin) is patent-protected, the Company will be entitled to a 15% royalty on annual net sales up to $75.0 million and an 18% royalty on annual net sales above $75.0 million. Following the end of patent protection in United States or Canada for Macrilen™ (macimorelin), the Company is entitled to a 5% royalty on net sales in that country. In addition, the Company will receive one-time payments ranging from $4.0 million to $100.0 million upon the achievement of commercial milestones going from $25.0 million annual net sales up to $500.0 million annual net sales.

In January 2018, the Company received a cash payment of $24.0 million from Strongbridge and on July 23, 2018, Strongbridge launched product sales of Macrilen™ (macimorelin) in the United States.

(ii) Pediatric Indication

Upon approval by the FDA of a pediatric indication for Macrilen™ (macimorelin), the Company will receive a one-time milestone payment from Strongbridge of $5.0 million.

(iii) PIP study

We have initiated an open label, single dose trial to investigate the pharmacokinetics, pharmacodynamics, safety and tolerability of macimorelin in pediatric patients from two to less than 18 years of age with suspected growth hormone deficiency ("GHD"). Under the terms of the License and Assignment Agreement, the licensee will pay 70% and the Company will pay the remaining 30% of the research and development costs associate with the PIP. During 2018, the Company invoiced Strongbridge $358,000 as its share of the costs incurred by the Company under the PIP; such amounts have been collected in full.

(iv) Interim supply arrangement

The Company has agreed to supply ingredients for the manufacture of Macrilen™ (macimorelin) during an interim period at a price that is set ‘at cost’, without any profit margin. During 2018, the Company invoiced $2,108,000 and has received payment in full of these invoices under an interim supply agreement.

Rest of world commercialization of macimorelin

On January 16, 2019, we announced that the EMA had granted marketing authorization for macimorelin for the diagnosis of AGHD. AGHD may occur in an adult patient who has a history of childhood onset GHD or may occur during adulthood as an acquired condition. Considering a population of 510 million for the European Union, research based on incidence prevalence suggests that at least 35,000 adults could be afflicted with GHD. This milestone marks a key development in our European commercialization strategy and we are in discussions with a variety of companies regarding licensing and/or distribution opportunities in the rest of the world.

Monetization of non-strategic assets

Other pipeline prospects for the Company include preclinical work done on AEZS-120, a prostate cancer vaccine, discovery research for ERK-inhibitors for Oncology indications; and discovery research conducted at the Medical University of South Carolina on Compound Library as well as other research and clinical development projects that have been undertaken by our German subsidiary.

2017 and earlier - Zoptrex™

Zoptrex™ is a complex molecule that combines a synthetic peptide carrier with doxorubicin, a well-known chemotherapy agent. The synthetic peptide carrier is a luteinizing hormone-releasing hormone ("LHRH") agonist, a modified natural hormone with affinity for the LHRH receptor. The design of the compound allows for the specific binding and selective uptake of the cytotoxic conjugate by LHRH receptor-positive tumors.

On January 30, 2017, we announced the completion of the clinical phase of the pivotal Phase 3 ZoptEC (Zoptarelin Doxorubicin in Endometrial Cancer) study with the occurrence of the 384th death.

On May 1, 2017, we announced that the ZoptEC pivotal Phase 3 clinical study of Zoptrex™ (zoptarelin doxorubicin) in women with locally advanced, recurrent or metastatic endometrial cancer did not achieve its primary endpoint of demonstrating a statistically significant increase in the median period of overall survival of patients treated with Zoptrex™ (zoptarelin doxorubicin) as compared to patients treated with doxorubicin and we discontinued its development. Similarly, we discontinued the development of AEZS-138/Disorazol Z, as it was based on the same concept as Zoptrex™ (zoptarelin doxorubicin).

We have licensed the development, commercialization and certain other rights to Zoptrex™ to Sinopharm A-Think for China, Hong Kong and Macau; to an affiliate of Orient EuroPharma Co., Ltd. for Taiwan and southeast Asia; to Rafa Laboratories, Ltd for Israel and the Palestinian territories and to Specialised Therapeutics Asia Pte Ltd for Australia and New Zealand.

We do not anticipate significant revenues from the Sinopharm License Agreement in the future other than the amortization of the remaining deferred revenue.

Other

Our commercial operations were significantly reduced in the fourth quarter of 2017. We eliminated our contract sales team in its entirety, as well as remaining sales management in November 2017, in accordance with the terms of our agreement with inVentiv Commercial Services, LLC, an affiliate of inVentiv Health, Inc. ("inVentiv"), a contract-sales organization. Our agreement with inVentiv commenced in November 2014.

Pursuant to termination of the inVentiv agreement, we ended our co-promotion with EMD Serono, Inc. ("EMD Serono") and Armune BioScience, Inc. ("Armune").

Until September 1, 2016, we co-promoted a product, EstroGel®, and until termination of our sales team in November 2017, the inVentiv sales force promoted two products:

Saizen® [somatropin (rDNA origin) for injection] is a prescription medicine indicated for the treatment of growth hormone deficiency in children and adults. We promoted Saizen® pursuant to our promotional services agreement (the “EMD Serono Agreement”) with EMD Serono Inc. which we entered into in May 2015 and amended as of December 31, 2016. The EMD Serono Agreement, as amended, provided that we were to promote Saizen® in specific agreed-upon U.S. territories to adult and pediatric endocrinologists in exchange for a sales commission that was based upon new patient starts of the product. The agreement was terminated in accordance with its terms in December 2017.

APIFINY® is the only cancer-specific, non-PSA blood test for the evaluation of the risk of prostate cancer. The test was developed by Armune, a medical diagnostics company that develops and commercializes unique proprietary technology exclusively licensed from the University of Michigan for diagnostic and prognostic tests for cancer. We entered into a co-marketing agreement with Armune in November 2015 (the “Armune Agreement”), which was amended effective as of June 1, 2016, which allowed us to exclusively promote APIFINY® throughout the entire United States. We received a commission for each test performed resulting from our targeted promotion without regard to any established baseline. The Armune Agreement, as amended, had a three-year term that renewed automatically for successive one-year periods. The parties agreed in January 2018 that the Armune Agreement was terminated.

Geographic Areas

A description of the principal geographic areas in which we compete, including a geographical and categorical breakdown of our revenues in the past three years is presented in note 25 (Segment information) to our consolidated financial statements included in this Annual Report on Form 20-F at Item 18.

Seasonality

As a specialty biopharmaceutical company, the Company does not consider any of its products or services to be seasonal.

Raw Materials

Raw materials and supplies are generally available in quantities adequate to meet the needs of our business. We will be dependent on third-party manufacturers for the pharmaceutical products that we or our licensees will market. An interruption in the availability of certain raw materials or ingredients, or significant increases in the prices paid by us for them, could have a material adverse effect on our business, financial condition, liquidity and operating results.

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Regulation of Drug Development

Generally. Governmental authorities in the United States, Canada, Europe and other countries extensively regulate the preclinical and clinical testing, manufacturing, labeling, storage, record keeping, advertising, promotion, export, marketing and distribution, among other things, of pharmaceuticals. Under the laws of the United States, the countries of the EU, and other countries, we are subject to obligations to ensure that our clinical trials are conducted in accordance with Good Clinical Practices ("GCP") guidelines and the investigational plan and protocols contained in an Investigational New Drug ("IND") application, or comparable foreign regulatory submission. Set forth below is a brief summary of the material governmental regulations affecting us in the major markets in which we intend to market our products and/or promote products that we acquire or in-license or to which we obtain promotional rights.

The United States. In the United States, the FDA's Center for Drug Evaluation and Research (CDER) under the Federal Food, Drug and Cosmetic Act of 1938, as amended (the "FDCA"), the Public Health Service Act and other federal statutes and regulations, subjects pharmaceutical products to rigorous review. In order to market and sell a new drug product in the United States, we must first test it and send CDER evidence from these tests to prove that the drug is safe and effective for its intended use. In most cases, these tests include extensive preclinical, clinical, and laboratory tests. A team of CDER physicians, statisticians, chemists, pharmacologists, and other scientists reviews the company's data and proposed labeling. If this independent and unbiased review establishes that a drug's health benefits outweigh its known risks, the drug is approved for sale. CDER does not test the drug itself but it does conduct limited research in the areas of drug quality, safety, and effectiveness standards. Before approving a new drug or marketing application, the FDA may conduct pre-approval inspections of the developer of the drug (the "sponsor"), its CROs and/or its clinical trial sites to ensure that clinical, safety, quality control, and other regulated activities are compliant with GCP, or Good Laboratory Practices ("GLP"), for specific non-clinical toxicology studies. Manufacturing facilities used to produce a product are also subject to ongoing inspection by the FDA. The FDA may also require confirmatory trials, post-marketing testing, and/or extra surveillance to monitor the effects of approved products, or place conditions on any approvals that could restrict the commercial applications of a product. Once approved, the labeling, advertising, promotion, marketing, and distribution of a drug or biologic product must be in compliance with FDA regulatory requirements.

The first stage required for ultimate FDA approval of a new biologic or drug involves completion of preclinical studies whereby a sponsor must test new drugs on animals for toxicity. Multiple species are used to gather basic information on the safety and efficacy of the compound being investigated and/or researched. The FDA regulates preclinical studies under a series of regulations called the current GLP regulations as well as regulatory requirements found in Part 21 subchapter D of the Code of Federal Regulations. If the sponsor violates these regulations, the FDA may require that the sponsor replicate those studies or can subject the sponsor to enforcement actions or penalties as described further below. The sponsor then submits to the FDA an IND application based on the results from initial testing that include the drug's composition and manufacturing, along with a plan for testing the drug on humans. The FDA reviews the IND to ensure that the proposed studies (clinical trials) do not place human subjects at unreasonable risk of harm. FDA also verifies that there are adequate informed consent and human subject protections in place. After a sponsor submits an IND application, it must wait 30 days before starting a clinical trial to allow FDA time to review the prospective study. If FDA finds a problem, it can order a clinical hold to delay an investigation, or interrupt a clinical trial if problems occur during the study. After the IND application is in effect, a sponsor may commence human clinical trials. The sponsor typically conducts human clinical trials in three sequential phases, but the phases may overlap. In Phase 1 trials, the sponsor tests the product in a small number of patients or healthy volunteers (typically 20-80 healthy volunteers), primarily for safety at one or more doses. The goal in this phase is to determine what the drug's most frequent side effects are and, often, how the drug is metabolized and excreted. Phase 2 studies begin if Phase 1 studies do not reveal unacceptable toxicity. In Phase 2, in addition to safety, the sponsor evaluates the efficacy of the product in a patient population somewhat larger than Phase 1 trials. The number of subjects in Phase 2 studies typically ranges from a few dozen to about 300. This phase aims to obtain preliminary data on whether a drug works in people who have a certain disease or condition. At the end of Phase 2, the FDA and sponsor try to come to an agreement on how large-scale studies in Phase 3 should be done.

Phase 3 studies begin if evidence of effectiveness is shown in Phase 2. Phase 3 trials typically involve additional testing for safety and clinical efficacy in an expanded population at geographically dispersed test sites. The sponsor must submit to the FDA a clinical plan, or "protocol", accompanied by the approval of the institutions participating in the trials, prior to commencement of each clinical trial. The FDA may order the temporary or permanent discontinuation of a clinical trial at any time. In the case of product candidates for cancer, the initial human testing may be done in patients with the disease rather than in healthy volunteers. Because these patients are already afflicted with the target disease, such studies may provide results traditionally obtained in Phase 2 studies. Accordingly, these studies are often referred to as "Phase 1/2" studies as they combine two phases. Even if patients participate in initial human testing and a Phase 1/2 study is carried out, the sponsor is still responsible for obtaining all the data usually obtained in both Phase 1 and Phase 2 studies.

The sponsor must submit to the FDA the results of the preclinical and clinical testing, together with, among other things, detailed information on the manufacture and composition of the product, in the form of a New Drug Application ("NDA") or, in the case of a biologic, a Biologics License Applications ("BLA"). In a process that can take a year or more, the FDA reviews this application and, when and if it decides that adequate data are available to show that the new compound is both safe and effective for a particular indication and that other applicable requirements have been met, approves the drug or biologic for marketing. The amount of time taken for this approval process is a function of a number of variables, including the quality of the submission and studies presented and the potential contribution that the compound will make in improving the treatment of the disease in question.

Orphan-drug designation is granted by the FDA Office of Orphan Drug Products to novel drugs or biologics that are intended for the safe and effective treatment, diagnosis or prevention of rare diseases or disorders that affect fewer than 200,000 people in the U.S., or that affect more than 200,000 people but are not expected to recover the costs of developing and marketing a treatment drug. The designation provides the sponsor with a seven-year period of U.S. marketing exclusivity if the drug is the first of its type approved for the specified indication or if it demonstrates superior safety, efficacy or a major contribution to patient care versus another drug of its type previously granted the designation for the same indication. We have been granted orphan drug designations for Macrilen™ (macimorelin) for the evaluation of growth hormone deficiency.

Under the Drug Price Competition and Patent Term Restoration Act of 1984 (the "Hatch-Waxman Act"), newly-approved drugs and indications may benefit from a statutory period of non-patent data exclusivity. The Hatch-Waxman Act provides five-year data exclusivity to the first applicant to gain approval of an NDA for a new chemical entity, or NCE, meaning that the FDA has not previously approved any other drug containing the same active pharmaceutical ingredient, or active moiety. Although protection under the Hatch-Waxman Act will not prevent the submission or approval of another full NDA, such an NDA applicant would be required to conduct its own preclinical and adequate, well-controlled clinical trials to demonstrate safety and effectiveness.

The Hatch-Waxman Act also provides three years of data exclusivity for the approval of new and supplemental NDAs, including Section 505(b)(2) applications, for, among other things, new indications, dosage forms, routes of administration, or strengths of an existing drug, or for a new use, if new clinical investigations that were conducted or sponsored by the sponsor are determined by the FDA to be essential to the approval of the application. This exclusivity, which is sometimes referred to as clinical investigation exclusivity, would not prevent the approval of another application if the sponsor has conducted its own adequate, well-controlled clinical trials demonstrating safety and efficacy, nor would it prevent approval of a generic product that did not incorporate the exclusivity-protected changes of the approved drug product.

The labeling, advertising, promotion, marketing, and distribution of a drug or biologic product must be in compliance with FDA regulatory requirements. Failure to comply with applicable requirements can lead to the FDA demanding that production and shipment cease and, in some cases, that the manufacturer recall products, or to enforcement actions that can include seizures, injunctions, and criminal prosecution. These failures can also lead to FDA withdrawal of approval to market a product.

Canada. In Canada, the Therapeutic Products Directorate of Health Canada is the Canadian federal authority that regulates pharmaceutical drugs and medical devices for human use. Prior to being given market authorization, a sponsor must present substantive scientific evidence of a product's safety, efficacy and quality as required by the Food and Drugs Act and other legislation and regulations. The requirements for the development and sale of pharmaceutical drugs in Canada are substantially similar to those in the United States, which are described above.

The European Union. Medicines can be authorized in the EU by using either the centralized authorization procedure or national authorization procedures. The EU has implemented a centralized procedure coordinated by the EMA for the approval of human medicines, which results in a single marketing authorization issued by the European Commission that is valid across the EU, as well as Iceland, Liechtenstein and Norway. The centralized procedure is compulsory for human medicines that are derived from biotechnology processes, such as genetic engineering, that contain a new active substance indicated for the treatment of certain diseases, such as HIV/AIDS, cancer, diabetes, neurodegenerative disorders or autoimmune diseases and other immune dysfunctions, and designated orphan medicines. For medicines that do not fall within these categories, an applicant has the option of submitting an

application for a centralized marketing authorization to the EMA, as long as the medicine concerned is a significant therapeutic, scientific or technical innovation, or if its authorization would be in the interest of public health.

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

•Decentralized procedure. Using the decentralized procedure, a sponsor may apply for simultaneous authorization in more than one EU country of medicinal products that have not yet been authorized in any EU country and that do not fall within the mandatory scope of the centralized procedure. The application will be reviewed by a selected Reference Member State ("RMS"). The Marketing Authorization granted by the RMS will then be recognized by the other Member States involved in this procedure.

•Mutual recognition procedure. In the mutual recognition procedure, a medicine is first authorized in one EU Member State, in accordance with the national procedures of that country. Following this, further marketing authorizations can be sought from other EU countries in a procedure whereby the countries concerned agree to recognize the validity of the original, national marketing authorization.

Regulation of Commercial Operations

The marketing, promotional, and pricing practices of human pharmaceutical manufacturers, as well as the manner in which manufacturers interact with purchasers and prescribers, are subject to various U.S. federal and state laws, including the federal anti-kickback statute and the False Claims Act and state laws governing kickbacks, false claims, unfair trade practices, and consumer protection, and to similar laws in other countries. In the U.S., these laws are administered by, among others, the Department of Justice ("DOJ"), the Office of Inspector General of the Department of Health and Human Services, the Federal Trade Commission, the Office of Personnel Management, and state attorneys general. Over the past several years, the FDA, the DOJ, and many other agencies have increased their enforcement activities with respect to pharmaceutical companies and increased the inter-agency coordination of enforcement activities.

In the U. S., biopharmaceutical and medical device manufacturers are required to record any transfers of value made to licensed physicians and teaching hospitals and to disclose such data to the Department of Health and Human Services ("HHS"). In addition to civil penalties for failure to report transfers of value to physicians or teaching hospitals, there will be criminal penalties if a manufacturer intentionally makes false statements or excludes information in such reports. The payment data across biopharmaceutical and medical device companies is posted by HHS on a publicly available website. Increased access to such data by fraud and abuse investigators, industry critics and media will draw attention to our collaborations with reported entities and will importantly provide opportunities to underscore the critical nature of our collaborations for developing new medicines and exchanging scientific information. This national payment transparency effort coupled with industry commitment to uphold voluntary codes of conduct (such as the PhRMA Code on Interactions with Healthcare Professionals and PhRMA Guiding Principles Direct to Consumer Advertisements About Prescription Medicines) and rigorous internal training and compliance efforts will complement existing laws and regulations to help ensure ethical collaboration and truthful product communications.

The Canadian association of Research-Based Pharmaceutical Companies ("Rx & D") has adopted "Guidelines for Transparency in Stakeholder Funding" that require member companies to regularly disclose, by means of the web sites and annual reports, a list of all stakeholders to which they provide direct funding. The term "stakeholder" is defined in Rx & D's Code of Ethical Practices to include "Health Care Professionals". In the EU, the disclosure code of transfers of value to healthcare professionals and organizations adopted by the European Federation of Pharmaceutical Industries and Associations ("EFPIA") requires all members of EFPIA to disclose transfers of value to healthcare professionals and healthcare organizations beginning in 2016, covering the relevant transfers in 2015. Each member company will be required to document and disclose: (i) the names of healthcare professionals and associations that have received payments or other transfers of value and (ii) the amounts or value transferred, and the type of relationship.

For more information about the regulatory risks associated with our business operations, see "Item 3D. Risk Factors".

Intellectual Property - Patents

We seek to protect our compounds, manufacturing processes, compositions and methods of medical use for our lead drugs and drug candidates through a combination of patents, trade secrets and know-how. Our patent portfolio consists of approximately 4 owned and in-licensed patent families (issued, granted or pending in the United States, Europe and other jurisdictions). The patent positions of companies in the biotechnology and pharmaceutical industries are highly uncertain and involve complex legal and factual questions. Therefore, we cannot predict the breadth of claims, if any, that may be allowed under any of our patent applications, or the enforceability of any of our allowed patents. See "Item 3.D. Risk Factors - We may not obtain adequate protection for our products through our intellectual property."

Patents extend for varying periods according to the date of patent filing or grant and the legal term of patents in the various countries where patent protection is obtained. The actual protection afforded by a patent, which can vary from

country to country, depends on the type of patent, the scope of its coverage and the availability of legal remedies in the country. In the United States, the patent term of a patent that covers an FDA-approved drug may also be eligible for patent term extension, which permits patent term restoration as compensation for the patent term lost during the FDA regulatory review process. The Hatch-Waxman Act permits a patent term extension of up to five years beyond the expiration of the patent, in which the patentee may file an application for yearly interim extensions within five years if the patent will expire and the FDA has not yet approved the NDA. The length of the patent term extension is related to the length of time the drug is under regulatory review. Patent extension cannot extend the remaining term of a patent beyond a total of 14 years from the date of product approval and only one patent applicable to an approved drug may be extended.

Similar provisions are available in Europe and other foreign jurisdictions to extend the term of a patent that covers an approved drug. In these jurisdictions, however, no interim extensions exist and the marketing approval must be granted before the patent expires. In the future, if and when our pharmaceutical products receive FDA approval, we expect to apply for patent term extensions on patents covering those products. While we anticipate that any such applications for patent term extensions will likely be granted, we cannot predict the precise length of time for which such patent terms would be extended in the United States, Europe or other jurisdictions. If we are not able to secure patent term extensions on patents covering our products for meaningful periods of additional time, we may not achieve or sustain profitability, which would adversely affect our business.

In addition to patent protection, our products may benefit from the market-exclusivity provisions contained in the orphan-drug regulations or the pediatric-exclusivity provisions or other provisions of the FDA Act, such as new chemical entity exclusivity or new formulation exclusivity. Orphan drug regulations provide incentives to pharmaceutical and biotechnology companies to develop and manufacture drugs for the treatment of rare diseases, currently defined as diseases that exist in fewer than 200,000 individuals in the U.S., or diseases that affect more than 200,000 individuals in the U.S. but that the sponsor does not realistically anticipate will generate a net profit. Under these provisions, a manufacturer of a designated orphan drug can seek tax benefits, and the holder of the first FDA approval of a designated orphan product will be granted a seven-year period of marketing exclusivity for such FDA-approved orphan product. In the U.S., the FDA has the authority to grant additional data protection for approved drugs where the sponsor conducts specified testing in pediatric or adolescent populations. If granted, this pediatric exclusivity provides an additional six months which are added to the term of data protection as well as to the term of any relevant patents, to the extent these protections have not already expired. We may also seek to utilize market exclusivities in other territories, such as in the EU. There can be no assurance that any of our drug candidates will obtain such orphan drug designation, pediatric exclusivity, new chemical entity exclusivity or any other market exclusivity in the U.S., the EU or any other territory, or that we will be the first to receive the regulatory approval in a given country or territory for such drugs so as to be eligible for any market exclusivity protection.

Macrilen™ (macimorelin):

We hold the worldwide rights to macimorelin pursuant to an exclusive license agreement with the French Centre National de la Recherche Scientifique, as licensor, and AEZS Germany, as licensee. Macrilen™ is the approved marketing name for macimorelin as licensed under the License and Assignment Agreement for commercialization in the U.S. and Canada, only.

The following patents and patent applications relate to macimorelin:

- U.S. patent 6,861,409 covers macimorelin and U.S. patent 7,297,681 covers other related growth hormone secretagogue compounds, each also covering pharmaceutical compositions comprising the compounds as well as their medical use for elevating the plasma level of growth hormone. U.S. patent 6,861,409 and U.S. patent 7,297,681 both expire in August 2022.
- European patent 1 289 951 covers macimorelin and European patent 1 344 773 covers other related growth hormone secretagogue compounds, pharmaceutical compositions comprising the compounds as well as their medical use for elevating the plasma level of growth hormone. EP patent 1 289 951 and EP patent 1 344 773 both expire in June 2021.
- Japanese patent 3 522 265 covers macimorelin and pharmaceutical compositions comprising the compounds as well as their medical use for elevating the plasma level of growth hormone. This patent expires in June 2021.
- Canadian patent 2,407,659 covers macimorelin and pharmaceutical compositions comprising the compounds as well as their medical use for elevating the plasma level of growth hormone. This patent expires in June 2021.
- U.S. patent 8,192,719 covers a method of assessing pituitary-related growth hormone deficiency in a human or animal subject comprising an oral administration of the compound macimorelin and determination of the level of growth hormone in the sample and assessing whether the level of growth hormone in the sample is indicative of growth hormone deficiency. This patent expires in October 2027.
- European patent 1 984 744 covers a method of assessing pituitary-related growth hormone deficiency by oral administration of macimorelin. This patent expires in February 2027.
- Japanese patent 4 852 728 covers a method of assessing pituitary-related growth hormone deficiency by oral administration of macimorelin. This patent expires in February 2027.

U.S. provisional patent applications Serial No. 62/607,866 was filed on December 19, 2017 and Serial No. 62/609,059 was filed on December 21, 2017. Both are identical and are directed to a method of assessing growth hormone deficiency comprising oral administration of a macimorelin containing composition and collecting one or two post-administration samples.

- A non-provisional U.S. application was filed on May 30, 2018 drawing the priority of both provisional applications. The US-PTO issued a Notice of Allowance on January 09, 2019. If granted, a patent would presumably expire December 19, 2037.
- A PCT application was filed December 18, 2018 drawing the priority of both provisional U.S. applications. In addition to the method of assessing growth hormone deficiency comprising oral administration of a macimorelin containing composition and collecting one or two post-administration samples, the PCT application also covers a similar method of assessing growth hormone deficiency using 3 post-administration samples.

Zoptrex™

We have licensed the intellectual property and associated rights relating to LHRH agonists and LH-RH antagonists carrying various cytotoxic radicals (including zoptarelin doxorubicin) from the Administrators of the Tulane Educational Fund ("Tulane") pursuant to a license agreement dated September 17, 2002 between Tulane, as licensor, and AEZS Germany, as licensee (the "Tulane Agreement"). The Tulane Agreement grants to us an exclusive worldwide license for all therapeutic uses of LH-RH agonists and LH-RH antagonists carrying various cytotoxic radicals, to the extent covered by one of the licensed patents. The term of the Tulane Agreement continues for ten years after the first commercial sale of a product based on the licensed intellectual property (a "Licensed Product") or until the expiration of the last to expire of the licensed patents, whichever is longer, on a country-by- country basis. Pursuant to the Tulane Agreement, we are required to pay Tulane the following amounts: (i) $400,000 upon the first grant of regulatory approval for a Licensed Product in the U.S., Canada, the EU or Japan; (ii) 10% of all consideration received by us from a sublicensee for authorization to use the licensed intellectual property to develop, manufacture, market, distribute and sell a Licensed Product; (iii) 2.5% of our net sales of Licensed Products; and (iv) 50% of any royalties that we receive from a sublicensee with respect to its net sales of Licensed Products; provided, however, that the payment with respect to royalties received from a sublicensee shall not be less than 1.75% nor more than 2.5% of the sublicensee's net sales of the Licensed Product.

All patents covered by the Tulane Agreement expired by November 2016. In early 2015, we filed a European patent application directed to a novel method of manufacturing Zoptrex™. Within the 12 months priority period, we also filed an international patent application for the manufacturing process, as well as national patent applications in selected countries, including the U.S., China, and Taiwan, Japan and India. As a consequence of the negative Phase 3 ZoptEC study received in April 2017, we ceased further Zoptrex™ development and intellectual property filings.

Disorazol Z - LHRH conjugates (AEZS-138):

We own a number of patents that relate to our Disorazol Z - LHRH conjugates. As a consequence of the negative Phase III ZoptEC study received in April 2017, we ceased further Disorazol Z - LHRH conjugate development and intellectual property filings.

C. Organizational structure

Our corporate structure, the jurisdiction of incorporation of our direct and indirect subsidiaries and the percentage of shares that we held in those subsidiaries as at December 31, 2018 is depicted in the chart set forth under the caption "Item 4.A. History and development of the Company".

D. Property, plants and equipment

Our registered address is located in Montreal, Canada. Our corporate head office is located in Summerville, South Carolina, which is a suburb of Charleston, South Carolina and our largest office is located in Frankfurt, Germany. We do not own any real property. The following table sets forth information with respect to our main facilities as at December 31, 2018.

Location	Use of space	Square Footage	Type of interest
315 Sigma Drive, Summerville SC 29486	Occupied for management, administration, commercial operations and business development	300	Leasehold
Weismüllerstr. 50 D-60314 Frankfurt-am-Main, Germany	Occupied for management, R&D, business development and administration	36,168	Leasehold

We believe that our current facilities are adequate to meet our ongoing needs and that, if we require additional space, we will be able to obtain additional facilities on commercially reasonable terms.

Item 4A Unresolved Staff Comments

Not required.

Item 5. Operating and Financial Review and Prospects

Key Developments

Macrilen™ (macimorelin) license agreement

Macrilen™ (macimorelin), a ghrelin receptor agonist, is a novel orally-active small molecule that stimulates the secretion of growth hormone. The FDA has granted marketing approval for Macrilen™ (macimorelin) to be used in the diagnosis of AGHD.

On January 16, 2018, the Company, through AEZS Germany, entered into the License and Assignment Agreement to carry out development, manufacturing, registration, regulatory and supply chain services for the commercialization of Macrilen™ (macimorelin) in the United States and Canada. This agreement provides (i) for the "right to use" license relating to the Adult Indication; (ii) for the right to acquire a license for the Pediatric Indication if and when the FDA approves a pediatric indication; (iii) that the licensee is to fund 70% of the costs of a pediatric clinical trial submitted for approval to the EMA and FDA (the "PIP") to be run by the Company with customary oversight from a joint steering committee (the "JSC"); and (iv) for the Interim Supply Arrangement.

(i) Adult Indication

Under the terms of the License and Assignment Agreement, and for as long as Macrilen™ (macimorelin) is patent-protected, the Company will be entitled to a 15% royalty on annual net sales up to $75.0 million and an 18% royalty on annual net sales above $75.0 million. Following the end of patent protection in United States or Canada for Macrilen™ (macimorelin), the Company is entitled to a 5% royalty on net sales in that country. In addition, the Company will receive one-time payments ranging from $4.0 million to $100.0 million upon the achievement of commercial milestones going from $25.0 million annual net sales up to $500.0 million annual net sales.

In January 2018, the Company received a cash payment of $24.0 million from Strongbridge and on July 23, 2018, Strongbridge launched product sales of Macrilen™ (macimorelin) in the United States.

(ii) Pediatric Indication

Upon approval by the FDA of a pediatric indication for Macrilen™ (macimorelin), the Company will receive a one-time milestone payment from Strongbridge of $5.0 million.

(iii) PIP study

We have initiated an open label, single dose trial to investigate the pharmacokinetics, pharmacodynamics, safety and tolerability of macimorelin in pediatric patients from two to less than 18 years of age with suspected GHD. Under the terms of the License and Assignment Agreement, the licensee will pay 70% and the Company will pay the remaining 30% of the research and

development costs associate with the PIP. During 2018, the Company invoiced Strongbridge $358,000 as its share of the costs incurred by the Company under the PIP; such amounts have been collected in full.

(iv) Interim supply arrangement

The Company has agreed to supply ingredients for the manufacture of Macrilen™ (macimorelin) during an interim period at a price that is set ‘at cost’, without any profit margin. During 2018, the Company invoiced $2,108,000 and has received payment in full of these invoices under an interim supply agreement.

Novo Nordisk purchase of Strongbridge License Agreement

Effective December 19, 2018, Strongbridge sold the United States and Canadian rights to Macrilen™ under the License and Assignment Agreement to Novo and Novo will fund Strongbridge's Macrilen™ (macimorelin) field organization as a contract field force to promote the product in the United States for up to three years.

Rest of world commercialization of macimorelin

On January 16, 2019, we announced that the European Medicines Agency ("EMA") had granted marketing authorization for macimorelin for the diagnosis of AGHD. AGHD may occur in an adult patient who has a history of childhood onset GHD or may occur during adulthood as an acquired condition. Considering a population of 510 million for the European Community, research based on incidence prevalence suggests that at least 35,000 adults could be afflicted with GHD. This milestone marks a key development in our European commercialization strategy and we are in discussions with a variety of companies regarding licensing and/or distribution opportunities in the rest of world (“ROW”).

Monetization of non-strategic assets

On May 1, 2017, we announced that the ZoptEC pivotal Phase 3 clinical study of Zoptrex™ (zoptarelin doxorubicin) in women with locally advanced, recurrent or metastatic endometrial cancer did not achieve its primary endpoint of demonstrating a statistically significant increase in the median period of overall survival of patients treated with Zoptrex™ (zoptarelin doxorubicin) as compared to patients treated with doxorubicin, and we discontinued its development. Similarly, we discontinued the development of AEZS-138/Disorazol Z, as it was based on the same concept as Zoptrex™ (zoptarelin doxorubicin).

Other pipeline prospects for the Company include preclinical work done on AEZS-120, a prostate cancer vaccine, discovery research for ERK-inhibitors for Oncology indications; and discovery research conducted at the Medical University of South Carolina on Compound Library as well as other research and clinical development projects which have been undertaken by our German subsidiary.

Commercial Operations

Our commercial operations were significantly reduced in the fourth quarter of 2017. We eliminated our contract sales team in its entirety, as well as remaining sales management in November 2017, in accordance with the terms of our agreement with inVentiv Commercial Services, LLC, an affiliate of inVentiv Health, Inc. ("inVentiv"), a contract-sales organization.

Pursuant to termination of the inVentiv agreement, we ended our co-promotion with EMD Serono, Inc. and Armune BioScience, Inc.

Until termination of our sales team in November 2017, the inVentiv sales force promoted two products during 2017: Saizen® [somatropin (rDNA origin) for injection] is a prescription medicine indicated for the treatment of growth hormone deficiency in children and adults. We promoted Saizen® pursuant to our promotional services agreement (the "EMD Serono Agreement") with EMD Serono, which we entered into in May 2015 and amended as of December 31, 2016. The EMD Serono Agreement, as amended, provided that we were to promote Saizen® in specific agreed-upon U.S. territories to adult and pediatric endocrinologists in exchange for a sales commission that was based upon new patient starts of the product. The agreement was terminated in accordance with its terms on December, 13 2017.

APIFINY® is the only cancer-specific, non-PSA blood test for the evaluation of the risk of prostate cancer. The test was developed by Armune BioScience, Inc. ("Armune"), a medical diagnostics company that develops and commercializes unique proprietary technology exclusively licensed from the University of Michigan for diagnostic and prognostic tests for cancer. We entered into a co-marketing agreement with Armune in November 2015 (the "Armune Agreement"), which was amended effective as of June 1, 2016, which allowed us to exclusively promote APIFINY® throughout the entire United States. We received a commission for each test performed resulting from our

targeted promotion without regard to any established baseline. The Armune Agreement, as amended, had a three-year term that renewed automatically for successive one-year periods. The parties agreed in January 2018 that the Armune Agreement was terminated.

Leadership

On May 8, 2018, the following individuals were elected to the Board of Directors: Carolyn Egbert, Michael Cardiff, Juergen Ernst, Gerard Limoges, Dr. Brent Norton, Jonathan Pollack, and Robin Smith Hoke. On September 25, 2018, we announced the appointment of Leslie Auld as Senior Vice President, Chief Financial Officer. On March 26, 2019, the Company announced that Mr. Cardiff has resigned from the board of directors for personal reasons.

Special Committee

On March 12, 2019, the Company announced that its board of directors has formed a special committee of independent directors (the "Special Committee") to review strategic options available to the Company. The Special Committee has approved the engagement by the Company of a financial advisor that is working with management to assist the Special Committee and the board of directors in considering a wide range of transactions (including opportunities for the license of Macrilen outside of the United States and Canada, or other monetization transactions relating to Macrilen. Management has evaluated whether material uncertainties exist relating to events or conditions as described in Note 4 of our Financial Statements included in this Form 20-F, and has considered the following in making that critical judgment.

The Company’s current operating budget and cash flows from operating activities in 2019 are expected to decline compared with 2018, however, the Company believes it will continue to generate growth in its royalty income, which, when combined with its forecasted cash and cash equivalents, the Company believes will provide liquidity that is in excess of its costs for at least, but not limited to, twelve months from the date of approval of these financial statements.

Contingencies

Securities class action litigation

The Company and certain of its current and former officers are defendants in a class-action lawsuit pending in the U.S. District Court for the District of New Jersey, brought on behalf of shareholders of the Company. The lawsuit alleges violations of the Securities Exchange Act of 1934 in connection with allegedly false and misleading statements made by the defendants between August 30, 2011 and November 6, 2014 (the "Class Period"), regarding the safety and efficacy of Macrilen™ (macimorelin) and the prospects for the approval of the Company's New Drug Application for the product by the FDA. The plaintiffs represent a class comprised of purchasers of the Company's common shares during the Class Period and seek damages, costs and expenses and such other relief as determined by the Court. The Company considers the claims that have been asserted in the lawsuit to be without merit and is vigorously defending against them. The Company cannot, however, predict at this time the outcome or potential losses, if any, with respect to this lawsuit.

Other litigation

In late July 2017, the Company terminated for cause the employment agreement of Mr. David A. Dodd, the former President and Chief Executive Officer and it also terminated the employment of Mr. Philip A. Theodore, the former Senior Vice President, Chief Administrative Officer, General Counsel and Corporate Secretary. On August 3, 2017, the Company filed a lawsuit against both Messrs. Dodd and Theodore for damages suffered by the Company for breach of confidence and/or breach of fiduciary duty in an amount to be determined prior to trial. On December 21, 2017, Messrs. Dodd and Theodore brought a counterclaim against the Company and its Chair, Carolyn Egbert, in the amount of CAN$6.0 million alleging, among other things, that defamatory statements were made against Messrs. Dodd and Theodore. On December 21, 2018, the matter was amicably resolved with the Company making a payment to Mr. Dodd in the amount of $775,000. The parties consider their contractual relationship as having been terminated.

Cogas Consulting, LLC ("Cogas") filed a lawsuit against the Company in state court in Fulton County, Georgia on February 2, 2018. The lawsuit was removed to federal court in Georgia. In the lawsuit, Cogas alleged that its employee (and sole shareholder) John Sharkey was entitled to a "success fee" commission on the Strongbridge License Agreement. Cogas was claiming damages in the form of a lost commission on the transaction. Cogas claims its commission is 5% on payments the Company receives within the first three years after January 14, 2018 including 5% of the $24.0 million Strongbridge already paid the Company, plus 5% of any royalty Strongbridge pays the Company through January 17, 2021. On November 5, 2018, the matter was amicably resolved with the Company making a payment to Cogas in the amount of $625,000. The parties now consider their contractual relationship as

having been terminated.

A. Operating Results

Consolidated Statements of Comprehensive Loss Information

(in thousands, except share and per share data)	Three months ended December 31,		Years ended December 31,		
	2018	2017	2018	2017	2016
	$	$	$	$	$
Revenues					
License fees	(332)	119	24,325	458	497
Product sales	1,446	—	2,167	—	—
Royalty income	184	—	184	—	—
Sales commission and other	94	59	205	465	414
	1,392	178	26,881	923	911
Cost of sales	1,413	—	2,104	—	—
Gross income	(21)	178	24,777	923	911
Operating expenses					
Research and development costs	767	526	2,932	10,704	16,495
General and administrative expenses	1,665	2,778	8,894	8,198	7,147
Selling expenses	588	452	3,109	5,095	6,745
	3,020	3,756	14,935	23,997	30,387
Income (loss) from operations	(3,041)	(3,578)	9,842	(23,074)	(29,476)
Settlements	(1,400)	—	(1,400)	—	—
Gain (loss) due to changes in foreign currency exchange rates	64	72	656	502	(70)
Change in fair value of warrant liability	(1,489)	(478)	263	2,222	4,437
Other finance income	104	21	278	75	150
Net finance income (costs)	(1,321)	(385)	1,197	2,799	4,517
Income (loss) before income taxes	(5,762)	(3,963)	9,639	(20,275)	(24,959)
Income tax recovery (expense)	636	3,479	(5,452)	3,479	—
Net income (loss)					