



AETERNA ZENTARIS INC.

FORM 20-F

(Annual And Transition Report (Foreign Private Issuer))

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

FORM 20-F

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

OR

☒ Annual Report Pursuant to Section 13 or 15(d) of The Securities Exchange Act of 1934 for the fiscal year ended December 31, 2022

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 001-38064

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)

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(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	Trading Symbol(s)	Name of Each Exchange on Which Registered
Common Shares	AEZS	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: 4,855,876 Common Shares as at December 31, 2022.

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

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 ☒

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

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

Indicate by check mark 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 ☒ 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 whether the registrant has filed a report on and attestation to its management’s assessment of the effectiveness of its internal control over financial reporting under Section 404(b) of the Sarbanes-Oxley Act (15 U.S.C. 7262(b)) by the registered public accounting firm that prepared or issued its audit report. ☐

If securities are registered pursuant to Section 12(b) of the Act, indicate by check mark whether the financial statements of the registrant included in the filing reflect the correction of an error to previously issued financial statements. ☐

Indicate by check mark whether any of those error corrections are restatements that required a recovery analysis of incentive-based compensation received by any of the registrant’s executive officers during the relevant recovery period pursuant to § 240.10D-1(b). ☐

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 Other ☐

International Accounting Standards Board ☒

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 ☒

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”, “Aeterna”, “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” and “€” are to euros, and references to “£” are to British Pounds. Unless otherwise indicated, all information contained in this Annual Report on Form 20-F are presented as of December 31, 2022.

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.

Special Note on Forward-Looking Statements

This Annual Report on Form 20-F and the documents incorporated herein by reference contain “forward-looking statements” made pursuant to the safe-harbor provision of the U.S. Private Securities Litigation Reform Act of 1995, which reflect our current expectations regarding future events. All statements other than statements of historical facts included in or incorporated by reference into 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**”) that address activities, events or developments that we expect, believe or anticipate will or may occur in the future are forward-looking statements. Our forward-looking statements may relate to the Company’s future outlook and anticipated events or results, and may include statements regarding the financial position, business strategy, growth strategy, budgets, operations, financial results, taxes, dividends, plans and objectives of the Company. Particularly, statements regarding future results, performance, achievements, prospects or opportunities of the Company are forward-looking statements. In some cases, forward-looking statements can be identified by the use of forward-looking terminology such as “plans”, “expects” or “does not expect”, “is expected”, “budget”, “scheduled”, “estimates”, “forecasts”, “intends”, “anticipates” or “does not anticipate” or “believes”, or variations of such words and phrases or state that certain actions, events or results “may”, “could”, “would”, “might”, “will” or “will be taken”, “occur” or “be achieved” or the negative of these words or other words and terms of similar meaning.

Certain forward-looking statements contained herein about prospective results of operations, financial position or cash flows may constitute a financial outlook. Such statements are based on assumptions about future events, are given as at the date hereof and are based on economic conditions, proposed courses of action and management’s assessment of the relevant information currently available. Management of the Company has approved the financial outlook as of the date hereof. Readers are cautioned that such financial outlook information contained herein should not be used for purposes other than for which it is disclosed herein.

Forward-looking statements are based on the opinions and estimates of the Company as of the date of this Annual Report, and they are subject to known and unknown risks, uncertainties, assumptions and other factors that may cause the actual results, level of activity, performance or achievements to be materially different from those expressed or implied by such forward-looking statements, including but not limited to the factors described in “*Risk Factors*” and those relating to: Aeterna’s expectations with respect to the DETECT-trial (including regarding the enrollment of subjects in the DETECT-trial, the application of the macimorelin growth hormone stimulation tests and the completion of the DETECT-trial); Aeterna’s expectations regarding conducting pre-clinical research to identify and characterize an AIM Biologicals-based development candidate for the treatment of NMOSD as well as Parkinson’s disease, and developing a manufacturing process for selected candidates; Aeterna’s expectations regarding conducting assessments in relevant Parkinson’s disease models; The University of Queensland undertaking a subsequent investigator initiated clinical trial evaluating macimorelin as a potential therapeutic for the treatment of ALS and Aeterna formulating a pre-clinical development plan for same; the commencement of Aeterna’s formal pre-clinical development of AEZS-150 in preparation for a potential IND filing for conducting the first in-human clinical study of AEZS-150; and the impacts associated with the termination of the license agreement with Novo Nordisk Healthcare AG.

Forward-looking statements involve known and unknown risks and uncertainties, and other factors which may cause the actual results, performance or achievements stated herein to be materially different from any future results, performance or achievements expressed or implied by the forward-looking information. Such risks and uncertainties include, among others, our reliance on the success of the pediatric clinical trial in the European Union and U.S. for Macrilen™ (macimorelin); the commencement of the DETECT-trial may be delayed or we may not obtain regulatory approval to initiate that study; we may be unable to enroll the expected number of subjects in the DETECT-trial and the result of the DETECT-trial may not support receipt of regulatory approval in CGHD; results from ongoing or planned pre-clinical studies of macimorelin by the University of Queensland or for our other products under development may not be successful or may not support advancing the product to human clinical trials; our ability to raise capital and obtain financing to continue our currently planned operations; 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 commercialize the product; our ability to enter into a new license agreement or similar arrangement following the termination of the license agreement with Novo Nordisk AG; the global instability due to the global pandemic of COVID-19, and its unknown potential effect on our planned operations; our ability to enter into out-licensing, development, manufacturing, marketing and distribution agreements with other pharmaceutical companies and keep such agreements in effect; and our ability to continue to list our common shares on the NASDAQ Capital Market (“**NASDAQ**”) or the Toronto Stock Exchange (“**TSX**”).

These risk factors are not intended to represent a complete list of the risk factors that could affect the Company. These factors and assumptions, however, should be considered carefully. More detailed information about these and other factors is included under “*Risk Factors*” in this Annual Report on Form 20-F and in other documents incorporated herein by reference.

However, we advise you to review any further disclosures we make on related subjects in our reports on Form 6-K filed or furnished to the SEC and in our other public disclosure filed under our profile on SEDAR at www.sedar.com.

Although the Company has attempted to identify important factors that could cause actual results to differ materially from those contained in forward-looking statements, there may be other factors that cause results not to be as anticipated, estimated or intended. Many of these factors are beyond our control. There can be no assurance that such statements will prove to be accurate, as actual results and future events could differ materially from those anticipated in such statements, particularly in light of the ongoing and developing COVID-19 pandemic and its impact on the global economy and its uncertain impact on the Company’s business. Accordingly, readers should not place undue reliance on forward-looking statements. The Company does not undertake to update any forward-looking statements contained herein, except as required by applicable securities laws. New factors emerge from time to time, and it is not possible for the Company to predict all of these factors, or to assess in advance the impact of each such factor on the Company’s business or the extent to which any factor, or combination of factors, may cause actual results to differ materially from those contained in any forward-looking statement.

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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. (Reserved)

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 occur, our business, prospects, financial condition or results of operations could be materially, adversely affected by any of these risks. Additional risks not presently known to us or that we currently deem immaterial may also impair our business operations. The trading price of our securities could decline due to any of these risks, and you may lose all or part of your investment. This Annual Report also contains forward-looking statements that involve risks and uncertainties. Our actual results could differ materially from those anticipated in these forward-looking statements as a result of certain factors, including the risks mentioned below. Forward-looking statements included in this Annual Report are based on information available to us on the date hereof, and all forward-looking statements in the documents incorporated by reference are based on information available to us as of the date of each such document. We disavow and are under no obligation to update or alter such forward-looking statements whether as a result of new information, future events or otherwise, other than as required by applicable securities legislation.

Risks Relating to Us and Our Business

Summary of Risk Factors

The following is a summary of the risk factors our business faces. The list below is not exhaustive and investors should read this "Risk Factors" section in full. Some of the risks we face include:

- the delisting of our Common Shares from the NASDAQ or the TSX could impact their market price and liquidity;
- we may be a passive foreign investment company, which could result in adverse tax consequences;
- our net operating losses may be limited under U.S. tax laws;
- our Rights Plan may prevent changes of control of the Company;
- the economic effects of COVID-19 may impact the market price of our Common Shares;
- investments in biopharmaceutical companies are generally considered to be speculative;
- risks relating to the failure to commercialize or out-license Macrilen™ (macimorelin);

- our revenues and expenses may fluctuate significantly and we may fail to meet financial expectations;
- the failure to complete the clinical trial program for the pediatric indication of Macrilen™ (macimorelin) could impact our operations;
- our dependence on strategic third party relationships regarding Macrilen™ (macimorelin);
- we may be unsuccessful in completing further out-licensing arrangement for Macrilen™ (macimorelin);
- we have initiated significant early-stage pre-clinical programs;
- we may require significant additional financing, and we may not have access to sufficient capital;
- we are and will be subject to ongoing government regulation for our products;
- marketing approval for Macrilen™ (macimorelin) could be subject to restrictions or withdrawals;
- healthcare reforms could hinder the commercial success of a product and affect our business;
- we may be subject to civil or criminal penalties if we interact with healthcare practitioners in a way that violates healthcare fraud or abuse laws;
- we may be unable to generate significant revenues if Macrilen™ (macimorelin) does not gain market acceptance;
- 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;
- we may not achieve our projected development goals in the time-frames we announce and expect;
- if we fail to obtain acceptable prices or adequate reimbursement for Macrilen™ (macimorelin), our ability to generate revenues will be diminished;
- competition in our targeted markets is intense, and development by other companies could render Macrilen™ (macimorelin), or any of our future products, non-competitive;
- we may not obtain adequate protection for Macrilen™ (macimorelin) through our intellectual property;
- we may infringe the intellectual property rights of others;
- patent litigation is costly and time consuming and may subject us to liabilities;
- we may not obtain trademark registrations for our current or future products;

- we rely on third parties to conduct, supervise and monitor our clinical trials, and those third parties may not perform satisfactorily;
- any difficulties or delays in our clinical trials could result in increased costs to us, delay or limit our ability to generate revenue and adversely affect our commercial prospects;
- the FDA and other foreign equivalents may not accept data from clinical trials outside the United States, in which case our development plans will be delayed, which could materially harm our business;
- in carrying out our operations, we are dependent on a stable and consistent supply of ingredients and raw materials;
- 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 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 may be subject to litigation in the future;
- we are subject to the risk of product liability claims for which we may not have adequate insurance coverage;
- 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;
- it may be difficult for U.S. investors to obtain and enforce judgments against us because of our Canadian incorporation and German presence;
- 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;

- we may have material weaknesses in our internal controls over financial reporting which could have a material adverse effect on the price of our Common Shares
- we are subject to environmental laws and may be subject to environmental remediation obligations. The impact of these obligations may have a material adverse effect on our business;
- we may incur losses associated with foreign currency fluctuations;
- legislative actions, new accounting pronouncements and higher insurance costs may adversely impact our future financial position or results of operations;
- data security breaches may disrupt our operations and adversely affect our operating results;
- our share price is volatile, which may result from factors outside of our control;
- we do not intend to pay dividends in the near future;
- future issuances of securities and hedging activities may depress 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 Securities Exchange Act of 1934 domestic reporting regime, which could cause us to incur additional legal, accounting and other expenses;
- our articles of incorporation contain “blank check” preferred share provisions, which could delay or impede an acquisition of our company; and
- our business could be negatively affected as a result of the actions of activist shareholders.

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

Our Common Shares are currently listed on both the NASDAQ and the TSX under the symbol “AEZS”. We must meet continuing listing requirements to maintain the listing of our Common Shares on the NASDAQ and the TSX. For continued listing, the NASDAQ requires, among other things, that listed securities maintain a minimum closing bid price of not less than \$1.00 per share.

On July 28, 2021, we received a letter from the Listing Qualifications Staff of the NASDAQ (the “Staff”), notifying us that for the last 30 consecutive business days prior to the date of the letter, the closing bid price of our common shares was below \$1.00 per share and, therefore, we did not meet the requirement for continued listing on Nasdaq as required by Nasdaq Listing Rule 5550(a)(2) (the “**Bid Price Rule**”). In accordance with Nasdaq Listing Rule 5810(c)(3)(A), we were granted a grace period of 180 calendar days, through January 24, 2022, and on January 26, 2022, we were granted a subsequent 180 calendar day extension, through July 26, 2022, to evidence compliance with the Bid Price Rule. In order to regain compliance with the Bid Price Rule, the Company implemented a reverse stock split (also known as a share consolidation) effective July 21, 2022 on the basis of one post-consolidation Common Share for every twenty-five pre-consolidation Common Shares. In addition to the minimum bid price requirement, the continued listing rules of the 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 securities by our total outstanding securities) 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.

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” who directly or indirectly hold stock of a passive foreign investment company (“**PFIC**”). We would 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.

The determination of whether we are, or will be, a PFIC for a taxable year depends, in part, on the application of complex U.S. federal income tax rules, which are subject to various interpretations. Although the matter is not free from doubt, we believe that we were not a PFIC during our 2022 taxable year and will not likely be a PFIC during our 2023 taxable year. Because PFIC status is based on our income, assets and activities for the entire taxable year, and our market capitalization, it is not possible to determine whether we will be characterized as a PFIC for the 2023 taxable year until after the close of the taxable year. The tests for determining PFIC status are subject to a number of uncertainties. These tests are applied annually, and it is difficult to accurately predict future income, assets and activities relevant to this determination. In addition, because the market price of our Common Shares is likely to fluctuate, the market price may affect the determination of whether we will be considered a PFIC. There can be no assurance that we will not be considered a PFIC for any taxable year (including our 2023 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. Accordingly, no assurance can be given that we will not constitute a PFIC in the current (or any future) tax year or that the Internal Revenue Service (the “**IRS**”) will not challenge any determination made by us concerning our 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 we will satisfy the record keeping requirements applicable to a QEF or that we will provide the information regarding our 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 IRS (on IRS Form 8621 *Information Return by a Shareholder of a Passive Foreign Investment Company or Qualified Electing Fund*, 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).

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 (the “Code”), 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 NOL carry-forwards and certain other tax attributes would be subject to an annual limitation, as described below. The unused portion of any such NOL 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 carry forwards may vary from state to state. Due to previous ownership changes, or if we undergo an ownership change in connection with or after this offering, our ability to use our NOLs could be limited by Section 382 of the Code. Future changes to our stock ownership, some of which are outside of our control, could result in an ownership change under Section 382 of the Code. Recent legislation added several limitations to the ability to claim deductions for NOLs in future years, particularly for tax years beginning after December 31, 2021, including a deduction limit equal to 80% of taxable income and a restriction on NOL carryback deductions. For these reasons, we may not be able to use a material portion of the NOLs, even if we attain profitability.

Prevention of Transactions Involving a Change of Control of the Company

Effective May 8, 2019, the shareholders re-approved our Rights Plan that provides the Board and the Company’s shareholders with additional time to assess any unsolicited take-over bid for the Company and, where appropriate, to pursue other alternatives for maximizing shareholder value. Under the Rights Plan, one right has been issued for each currently issued Common Share, and one right will be issued with each additional Common Share that may be issued from time to time. The Rights Plan may have a significant anti-takeover effect. The Rights Plan has the potential to significantly dilute the ownership interests of an acquiror of our shares, and therefore may have the effect of delaying, deterring or preventing a change in control of the Company.

The economic effects of a pandemic, epidemic or outbreak of an infectious disease could adversely affect our operations or the market price of our Common Shares.

Public health crises such as pandemics, epidemics or similar outbreaks, including the novel strain of coronavirus known as “COVID-19”, could adversely impact our operations or the market price of our Common Shares. The extent to which COVID-19 impacts our operations or the market price of our Common Shares will depend on future developments, which are highly uncertain and cannot be predicted with confidence, either internationally or within the U.S., Canada or Germany, including the duration of the outbreak, new information that may emerge concerning the severity of COVID-19, and the actions to contain the virus or treat its impact, among others. COVID-19, however, has already resulted in significant volatility in the world and the national trading markets.

The spread of COVID-19 may impact our operations, including the potential interruption of our clinical trial activities and our supply chain. For example, the rise in the Omicron variant in the COVID-19 pandemic has caused delays in site initiation and patient enrollment in our Phase 3 DETECT clinical trial for diagnostic use in childhood-onset growth hormone deficiency. As well, sales activities for Macrilen™ in the US by Novo Nordisk may be impacted due to delays of diagnostic activities on adult growth hormone deficiency (“AGHD”) in the U.S. In addition, the COVID-19 pandemic may also cause some patients to be unwilling to enroll in our trials or be unable to comply with clinical trial protocols if quarantines impede patient movement or interrupt healthcare services, which would delay our ability to conduct clinical trials or release clinical trial results on a timely basis and could delay our ability to obtain regulatory approval and commercialize our product candidates. The spread of an infectious disease, including COVID-19, may also result in the inability of our suppliers to deliver components or raw materials on a timely basis or at all. In addition, hospitals may reduce staffing and reduce or postpone certain treatments in response to the spread of an infectious disease. Such events may result in a period of business disruption and, in reduced operations, doctors or medical providers may be unwilling to participate in our clinical trials, any of which could materially affect our business, financial condition or results of operations. The significant spread of COVID-19 within the U.S., Canada or Germany resulted in a widespread health crisis and has had adverse effect on the national economies generally, the markets that we serve, our operations and the market price of our Common Shares.

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, in which companies often experience lengthy development time, extensive capital requirements, rapid technological developments and a high degree of competition based primarily on scientific and technological factors. These factors include the availability to obtain patent and other protection for technology and products, the ability to commercialize technological developments and the ability to obtain government approval for testing, manufacturing and marketing. Accordingly, investments in biopharmaceutical companies should be considered to be speculative assets.

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 the Company could be imperiled.

Our lead product, Macrilen™ (macimorelin), is the first and only U.S. Food and Drug Administration and European Commission approved oral test indicated for the diagnosis of patients with AGHD and we currently do not have any other products. We are focused on opportunistically utilizing our network with universities in Europe and the U.S., which we believe will provide vital access to innovative development candidates in different indications, with a focus on rare or orphan indications and potential for pediatric use. To date, we have signed agreements to establish this growing pipeline across a number of indications, including neuromyelitis optica spectrum disorder (“NMOSD”) and Parkinson’s disease (“PD”), primary hypoparathyroidism and amyotrophic lateral sclerosis (“ALS”, or Lou Gehrig’s disease).

We are a party to license agreements to carry out development, manufacturing, registration and commercialization of Macrilen™ (macimorelin) in the U.S., Canada, the European Economic Area, the United Kingdom, and the Republic of Korea. We are party to a distribution agreement for the commercialization of Macrilen™ (macimorelin) in Israel and the Palestinian Authority, Turkey and some non-European Union Balkan countries. We continue to explore licensing and distribution opportunities worldwide.

As noted above, on August 26, 2022, the Company announced that it will regain full rights to Macrilen™ in the U.S. and Canada, following Novo’s termination of the development and commercialization license agreement, which triggered a 270-day notice period. Although the Company is actively engaged in exploring all options for Macrilen™ in the U.S. and Canada, there can be no assurance that the Company will be able to enter into a similar agreement or any agreement with respect to the rights to Macrilen™ in the U.S. and Canada.

The commercial success of Macrilen™ (macimorelin) depends on several factors, including, but not limited to, the following:

- receipt of approvals from foreign regulatory authorities;
- successfully negotiating pricing and reimbursement in key markets in the EU for Macrilen™ (macimorelin);
- successfully contracting with qualified third-party suppliers to manufacture Macrilen™ (macimorelin);
- developing appropriate distribution and marketing infrastructure and arrangements for our product;

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- 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 of Common Shares 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 following:

- the timing and willingness of any current or future collaborators to invest the resources necessary to commercialize Macrilen™ (macimorelin);
- not obtaining necessary regulatory approvals from the United States Food & Drug Administration (“FDA”), the European Medicines Agency (“EMA”), the European Commission (“EC”) or other agencies that may delay or prevent us from obtaining approval of a pediatric indication for Macrilen™ (macimorelin), which may affect the share price of our Common Shares;
- the timing of regulatory submissions and approvals;
- the nature and timing of licensing fee revenues;
- the outcome of future litigation;
- foreign currency fluctuations;
- the effects of the recent outbreak of COVID-19, including the effects of intensified efforts to contain the spread of the virus, which has, to date, included, among other things, quarantines and travel restrictions;
- 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 share 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. Furthermore, children have different metabolic issues than adults. 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 Research Organizations ("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 guidance;
- 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).

Our arrangements with 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 various partners to commercialize macimorelin in the U.K. and EU and the Republic of Korea. As set out above, the Company will regain full rights to Macrilen™ following the termination of the license agreement with Novo Nordisk. Most of our potential revenue consists of contingent payments, including milestones and royalties on the sale of Macrilen™ (macimorelin). The milestone and royalty revenue that we may receive under this collaboration will depend upon these parties' ability to successfully introduce, market and sell Macrilen™ (macimorelin). If they do not devote sufficient time and resources to their respective collaboration arrangements 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 these relationships 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.

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).

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 existing License Agreements and commercialization agreements signed with Novo Nordisk, Consilient

Health, MegaPharm Ltd. and ER Kim Pharmaceuticals Bulgaria Eood and NK MEDITECH Ltd. If we elect to collaborate with third parties in respect of macimorelin, we may not be able to negotiate a collaborative arrangement for macimorelin on favorable terms and conditions, if at all. Should any partner fail to successfully commercialize macimorelin, our business, financial condition and results of operations may be adversely affected.

We have initiated significant early-stage pre-clinical programs

Over the course of 2021, we in-licensed four new pre-clinical development programs related to potential therapeutics, all of which were added to our development pipeline based on their potential to represent significant individual market opportunities. These pre-clinical development programs are at an early stage of development and none of these potential products has obtained regulatory approval for commercial use and sale in any country and, as such, no revenues have resulted from product sales. Significant additional investment will be necessary to complete the development of any of our product candidates. Pre-clinical and clinical trial work must be completed before our potential products could be ready for use within the markets that we have identified. We may fail to develop any products, obtain regulatory approvals, enter clinical trials or commercialize any products. We do not know whether any of our potential product development efforts will prove to be effective, meet applicable regulatory standards, obtain the requisite regulatory approvals, be capable of being manufactured at a reasonable cost or be accepted in the marketplace. We also do not know whether sales, license fees or related royalties will allow us to recoup any investment we make in the commercialization of our products. The product candidates we are currently developing are not expected to be commercially viable for at least the next several years and we may encounter unforeseen difficulties or delays in commercializing our product candidates. In addition, our potential products may not be effective or may cause undesirable side effects.

Our product candidates require significant funding to reach regulatory approval assuming positive clinical results. Such funding for our product candidates may be difficult, or impossible to raise in the public or private markets or through partnerships. If funding or partnerships are not readily attainable, the development of our product candidates may be significantly delayed or stopped altogether. The announcement of a delay or discontinuation of development would likely have a negative impact on our share price.

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

We may require significant additional capital to fund our commercialization efforts and may require additional capital to pursue planned clinical trials and regulatory approvals. Although we believe that our existing cash on hand will be sufficient to fund our anticipated operating and capital expenditure requirements for the next 12 months, we do not anticipate generating significant revenues from operations in the near future. Moreover, 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 securities. 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 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, but not limited to, the following:

- 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 future litigation; 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 manufacturing, marketing and sale of Macrilen™ (macimorelin) and our product candidates are and will be subject to strict and ongoing regulation, even with marketing approval by the FDA and the EC for Macrilen™ (macimorelin). Compliance with such regulation will be expensive and consume substantial financial and management resources. For example, the EC 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 ("GMP") 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 U.S. for Macrilen™ (macimorelin) to be used in the diagnosis of patients with AGHD, and on January 16, 2019, the EC 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' businesses or 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, the EC and other health authorities. In addition, regulations and guidance are often revised or reinterpreted by health agencies in ways that may significantly affect our business. 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 the President of the U.S. Additionally, in the U.S., individual 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 as there have been executive, judicial and congressional challenges to certain aspects of the ACA. In June 2021, the United States Supreme Court dismissed a challenge to the ACA on the grounds the plaintiffs did not have standing to attack as unconstitutional the ACA's minimum essential coverage provision because they had not shown they had suffered damages from the defendants' conduct in enforcing the ACA. It is unclear how other such litigation and the healthcare reform efforts of the Biden administration will impact the ACA and our business.

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 or 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 national or third-party payers for our current product, U.S. federal and state healthcare laws and regulations, as well as certain EU regulatory and government agencies, pertaining to fraud or abuse are and will be applicable to our business. We, and our licensees, are subject to healthcare fraud and abuse regulation by EU regulatory and government agencies in the countries where we may seek marketing access, and the U.S. federal government and the states in which we conduct our business.

The laws that may affect us or affect 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 or 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 a 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 immediately noted above 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 of 2010, 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 EU government and regulatory agencies and applicable U.S. 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, the following:

- 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 or tests for the indications we target;
- the advantages and disadvantages of Macrilen™ (macimorelin) relative to current or alternative treatments and tests;
- the classification and description of Macrilen™ (macimorelin) in relevant guidelines;
- 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 share 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.

We are currently focusing our efforts on Macrilen™ (macimorelin) for specific indications and for our four pre-clinical programs. 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 – if pursued – 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 any of our products or product candidates. 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) or any of our future product candidates. If we fail to achieve one or more of these milestones as planned, the share price of our Common Shares may 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 the President of the U.S. 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. Furthermore, there is drug pricing reform taking place at the state level in the U.S. that will impact how pharmaceutical companies can market and sell drug products and at what price. Additionally, 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), or any of our future products, non-competitive.

The biopharmaceutical field is highly competitive. New products developed by other companies in the industry could render Macrilen™ (macimorelin) or any of our future products uncompetitive or significantly less competitive. Competitors are developing and testing products and technologies that would compete with Macrilen™ (macimorelin) or any of our future products. Some of these competitive products may be more effective or have an entirely different approach or means of accomplishing the desired effect than Macrilen™ (macimorelin) or any of our future products. 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 or given market. 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 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 CROs, 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 GCP guidelines and the investigational plan and protocols contained in an IND 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.

We are dependent on, and rely upon, third parties to perform various functions related to our business, including, but not limited to, development of some of our product candidates. Our reliance on these relationships poses a number of risks.

Any difficulties or delays in the commencement or completion, or termination or suspension, of our ongoing or planned clinical trials could result in increased costs to us, delay or limit our ability to generate revenue and adversely affect our commercial prospects.

Before we can initiate clinical trials for our product candidates, we must submit the results of preclinical studies to the FDA or comparable foreign regulatory authorities along with other information, including information about product candidate chemistry, manufacturing and controls and our proposed clinical trial protocol, as part of an IND or similar regulatory filing required for authorization to proceed with clinical development. The FDA or comparable foreign regulatory authorities may require us to conduct

additional preclinical studies for any product candidate before it allows us to initiate clinical trials under any IND or similar regulatory filing, which may lead to delays and increase the costs of our preclinical development programs. Any such delays in the commencement or completion of the DETECT-trial evaluating macimorelin for the diagnosis of CGHD, or any other product candidate, could significantly affect our product development costs.

Further, conducting clinical trials in foreign countries, as in our ongoing DETECT-trial, presents additional risks that may delay completion of our clinical trials. These risks include the failure of enrolled patients in foreign countries to adhere to clinical protocol as a result of differences in healthcare services or cultural customs, managing additional administrative burdens associated with foreign regulatory schemes, as well as political and economic risks, including war, relevant to such foreign countries. For example, in 2022 our DETECT-trial activities in both Russia and Ukraine were halted due to the Russian invasion of Ukraine, which represented approximately 25 of the planned total patients in the trial, resulting in a delay in the expected completion of the trial. To replace these countries and ensure the timely completion of the DETECT-trial, the Company engaged a second CRO to establish testing sites in four new countries (Armenia, Slovakia, Greece, and Turkey). Clinical trial applications are ongoing, however, Russia's invasion of Ukraine has impacted our ability to conduct certain trials in the region and caused delays in the trial to date. This could hinder the completion of our clinical trials and/or analyses of clinical results, which could materially harm our business.

We are conducting our DETECT-trial of macimorelin globally and may conduct future clinical trials outside the United States. However, the FDA and other foreign equivalents may not accept data from such trials, in which case our development plans will be delayed, which could materially harm our business.

In particular, we have engaged two CRO's to conduct our DETECT-trial outside of the United States, including in Russia and Ukraine. As a result of Russia's invasion of Ukraine in February 2022, clinical trial sites in Ukraine and the surrounding region were halted. Furthermore, the United States and its European allies have imposed significant new sanctions against Russia, including regional embargoes, full blocking sanctions, and other restrictions targeting major Russian financial institutions. Our ability to conduct clinical trials in Russia, parts of Ukraine and elsewhere in the region were restricted under applicable sanctions laws, which required us to identify alternative trial sites, which increased our development costs and delayed the clinical development of our product candidates. All of the foregoing could impede the execution of our clinical development plans, which could materially harm our business.

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 may be subject to litigation in the future.

We may, from time to time, be a party to 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 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 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 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. As a result, 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 securities 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 securities 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, therefore, will have priority over the holders of our securities. 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 securities. 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(s) of AEZS Germany to institute insolvency proceedings of that subsidiary if the managing director(s) 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 of 2002* (“**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 or interim 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.

We may have material weaknesses in our internal controls over financial reporting which could have a material adverse effect on the price of our Common Shares

Internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. Disclosure controls and procedures are designed to ensure that information required to be disclosed by a company in reports filed with securities regulatory agencies is recorded, processed, summarized and reported on a timely basis and is accumulated and communicated to a company's management, including its Chief Executive Officer and Chief Financial Officer, as appropriate, to allow timely decisions regarding required disclosure. The Company has invested resources to document and analyze its system of disclosure controls and its internal control over financial reporting. A control system, no matter how well designed and operated, can provide only reasonable, not absolute, assurance with respect to the reliability of financial reporting and financial statement preparation.

We are subject to a broad range of environmental laws and regulations and may be subject to environmental remediation obligations under such safety and related laws and regulations. The impact of these obligations and the Company's ability to respond effectively to them may have a material adverse effect on our business, financial condition, cash flows and results of operations and could cause the market value of our Common Shares to decline.

We are subject to a broad range of federal, state, provincial and local environmental laws and regulations in the U.S., Canada and Germany concerning the environment, safety matters, regulation of chemicals and product safety in the countries where we manufacture and sell our products or otherwise operate our business. These requirements include, among other matters, regulation of the handling, manufacture, transportation, storage, use and disposal of materials, including the discharge of pollutants, hazardous substances and waste into the environment. In the normal course of our business, such substances and waste may be released into the environment, which could cause environmental or property damage or personal injuries, and which could subject us to remediation obligations regarding contaminated soil and groundwater, potential liability for damage claims or to social or reputational harm and other similar adverse impacts. Under certain laws, we may be required to remediate contamination at certain of our properties regardless of whether the contamination was caused by us or by previous occupants of the property, or by others and at third-party sites where we send waste.

In recent years, the operations of all companies have become subject to increasingly stringent legislation and regulation related to environmental protection. Such legislation and regulations are complex and constantly changing. Future events, such as changes in existing laws or regulations or the enforcement thereof, or the discovery of contamination at our facilities may, among other things, require us to install additional controls for certain of our emission sources, undertake changes in our manufacturing processes, remediate soil or groundwater contamination at facilities where such cleanup is not currently required, or to take action to address social expectations or concerns arising from or relating to such changes and our response to such changes. The cost of such additional compliance or remediation obligations or responding to such social expectations or concerns may be significant and could have a material adverse effect on our business, financial condition, cash flows and results of operations and could cause the market value of our Common Shares and/or debt securities to decline.

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 research and development 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 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, 2022 and December 31, 2022, the closing price of our Common Shares ranged from \$3.02 to \$10.50 per share on the NASDAQ and from C\$4.05 to C\$12.75 per share on the TSX. As of March 22, 2023, the price of our Common Shares on the NASDAQ was \$2.60 and C\$3.65 on the 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, the following:

- developments regarding current or future third-party suppliers and licensee(s);
- clinical trial and regulatory developments regarding Macrilen™ (macimorelin);
- delays in our anticipated clinical trial 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, including the instability due to COVID-19.

Our listing on both the NASDAQ and the 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 share 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 securities or convertible securities, including the issuance of securities upon the exercise of stock options and upon the exercise of warrants or other convertible securities or securities pursuant to which Common Shares are issuable, could dilute the interests of our existing shareholders, and could substantially decrease the trading share 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 plans generally permit 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.

In addition, the share price of our Common Shares could also be affected by possible sales of securities 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 securities. This hedging or arbitrage could, in turn, affect the trading share 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 Securities Exchange Act of 1934 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 2022, 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, 2022, we continued to be a foreign private issuer.

There can be no assurance, however, that we will remain a foreign private issuer either in 2023 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 Securities Exchange Act of 1934 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 the 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. 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 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. 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.

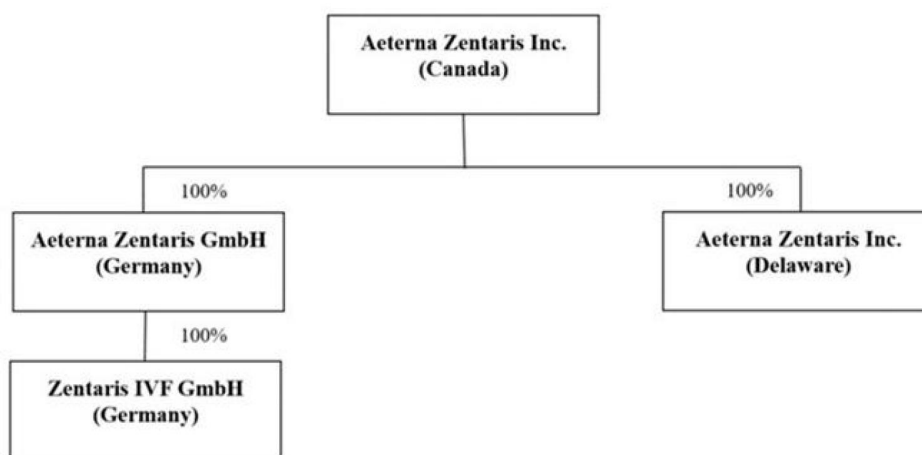
Item 4. Information on the Company

A. History and development of the Company

Aeterna Zentaris Inc. was incorporated on September 12, 1990 under the *Canada Business Corporations Act* (the “CBCA”) and continues to be governed by the CBCA. Our registered address is located at 222 Bay St., Suite 3000, Toronto, Ontario, Canada M5K 1E7 c/o Norton Rose Fulbright Canada LLP and we operate another office located at 315 Sigma Drive, Summerville, South Carolina 29486; our telephone number is (843) 900-3223 and our website is www.zentaris.com.

In May 2004, we changed our name to Aeterna Zentaris Inc.. On July 15, 2022, we completed a 25-for-1 Share Consolidation (reverse stock split) and previously, on November 17, 2015, we completed 100-to-1 Share Consolidation (reverse stock split). Our Common Shares commenced trading on a consolidated and adjusted basis on both the NASDAQ and the TSX on November 20, 2015.

We currently have three wholly-owned direct and indirect subsidiaries: Aeterna Zentaris GmbH (“AEZS Germany”), based in Frankfurt am Main, Germany and incorporated under the laws of Germany; Zentaris IVF GmbH, a direct wholly-owned subsidiary of AEZS Germany based in Frankfurt am Main, Germany and incorporated under the laws of Germany; and Aeterna Zentaris, Inc., an entity incorporated in the State of Delaware with an office in the Charleston, South Carolina area in the U.S.



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

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

Recent Developments

Please see “Item 4.B. – Business Overview” (below) for a complete description of the recent events and developments relevant to the Company.

B. Business overview

Aeterna Zentaris is a specialty biopharmaceutical company commercializing and developing therapeutics and diagnostic tests. The Company’s lead product, Macrilen™ (macimorelin), is the first and only U.S. Food and Drug Administration (“FDA”) and European Medicines Agency (“EMA”) approved oral test indicated for the diagnosis of patients with adult growth hormone deficiency (“AGHD”). Macimorelin is currently marketed in the U.S. under the tradename Macrilen™ through the license agreement and the amended license agreement (collectively the “Novo Amendment”) with Novo, who was granted an exclusive license for the development, manufacturing, registration and commercialization of Macrilen™ (macimorelin) for the diagnosis of adult and pediatric growth hormone deficiency in the U.S. and Canada, as discussed further below. On August 26, 2022, the Company announced that Novo had exercised its right to terminate the Novo Amendment. Following a 270-day notice period, Aeterna will regain full rights to Macrilen™ in the U.S. and Canada on May 23, 2023.

With respect to other global markets, we entered into an exclusive licensing agreement with Consilient Health Limited (“Consilient Health” or “CH”) for the commercialization of macimorelin in the European Economic Area and the United Kingdom. Commercialization in European countries began in Q2, 2022. On March 15, 2023, with the Company’s consent, Consilient Health entered into an assignment agreement to transfer the current licensing agreement for the commercialization of macimorelin in the European Economic Area and the United Kingdom to Atnahs Pharma UK Limited (“Pharmanovia”) and the Company and Pharmanovia entered into an exclusive supply agreement, pursuant to which the Company agreed to provide the Licensed Product to Pharmanovia. We have entered into a commercialization and supply agreement with MegaPharm Ltd., which is seeking regulatory approval and plans to subsequently commercialize macimorelin in Israel and the Palestinian Authority. We entered into license and supply agreements with NK Meditech Ltd. (“NK”), a subsidiary of PharmBio Korea, effective November 30, 2021, and a distribution and commercialization agreement with ER Kim Pharmaceuticals Bulgaria EOOD (“ER-Kim”), effective February 1, 2022. The agreements with NK are related to the development and commercialization of macimorelin for the diagnosis of AGHD and CGHD in the Republic of Korea, while the agreement with ER-Kim is related to the commercialization of macimorelin for the diagnosis of growth hormone deficiency in children and adults in Turkey and some non-European Union Balkan countries. We also are leveraging the clinical success and compelling safety profile of macimorelin to develop the compound for the diagnosis of CGHD, an area of significant unmet need. The Company is actively pursuing business development opportunities for the commercialization of macimorelin in Asia and the rest of the world.

The Company is also dedicated to the development of therapeutic assets and has recently taken steps to establish a pre-clinical pipeline to potentially address unmet medical needs across a number of indications, with a focus on rare or orphan indications and with the potential for pediatric use. To date, we have signed agreements to establish this pipeline across a number of indications, including NMOSD, PD, primary hypoparathyroidism and ALS.

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 has potential uses in both endocrinology and oncology indications. Macrilen™ (macimorelin) was granted orphan-drug designation by the FDA for use in the diagnosis of growth hormone deficiency (“GHD”).

Competitors for Macrilen™ (macimorelin) as a product for the diagnosis 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:

- 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 can be quickly hospitalized. The ITT is not used for patients with comorbidities, 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 growth hormone releasing hormone-arginine stimulation test (“GHRH + ARG”) 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 has been proposed to be the best alternative to ITT, but GHRH + ARG is no longer available in the U.S. This test is administered through an IV.

Oral administration of Macrilen™ (macimorelin) offers convenience and simplicity over the current GHD tests used, all of which require either IV or IM 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. patients with 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 well-positioned to displace the ITT as the preferred means by endocrinologists 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
- the evaluation can be conducted in the physician’s office rather than in a hospital-like setting.

We believe that approximately 15,000 – 20,000 AGHD tests will be conducted annually, in the U.S., after full market introduction of Macrilen™ (macimorelin). In addition, based on published information from the U.S. Centers for Disease Control and Prevention, different scientific publications, Huron, TVG and Navigant Research, we estimate that the total potential U.S. market for AGHD evaluation is in the range of 28,000 to 43,000 tests per year, excluding the evaluation of patients who have suffered a traumatic brain injury (“TBI”). In patients with a TBI, GHD is frequent and may contribute to cognitive sequelae and reduction in quality of life. GHD may develop in approximately 10% to 35% of TBI victims according to published study results. These data support a large upside potential for GHD testing.

Macimorelin Development History

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

2017 - present

- 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 Prescription Drug User Fee Amendment date of December 30, 2017 by the FDA.
- On November 27, 2017, the EMA accepted our MAA 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 AGHD.
- On January 16, 2018, the Company, through AEZS Germany, entered into a License 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 Macrilen® (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 EMA adopted a positive opinion recommending a marketing authorization for macimorelin.
- On January 16, 2019, we announced that the EC granted marketing authorization for macimorelin.
- On December 18, 2019, we announced that the American Association of Clinical Endocrinologists ("AACE") and the American College of Endocrinology ("ACE") published new "Guidelines for Management of Growth Hormone Deficiency in Adults and Patients Transitioning from Pediatric to Adult Care" ("Guidelines"). The AACE/ACE 2019 Guidelines identify macimorelin as a "shorter and simpler alternative" compared to the traditionally available GHST.
- On January 28, 2020, we announced the successful completion of patient recruitment for the first pediatric study of macimorelin as a growth hormone stimulation test for the evaluation of growth hormone deficiency (GHD) in children.
- On April 6, 2020, we announced positive results for the first pediatric study of macimorelin as a growth hormone stimulation test for the evaluation of child-onset growth hormone deficiency (CGHD).
- On April 7, 2020, we announced the decision of the European Medicines Agency (EMA) to accept a modification request by AEZS of the Company's Pediatric Investigation Plan (PIP) for macimorelin.
- On June 25, 2020, we announced that we had entered into an exclusive distribution and related quality agreement with MegaPharm Ltd. for the commercialization of Macrilen® in Israel and the Palestinian Authority.
- On July 22, 2020, we filed two patent applications in connection with macimorelin. Both patent applications relate to the invention of macimorelin as a method to diagnose growth hormone deficiency in pediatric patients.
- On November 16, 2020, we announced that, through a wholly-owned subsidiary, we had entered into an amendment of its existing license agreement with Novo Nordisk Biopharm Ltd. (NNBL) related to the development and commercialization of macimorelin. The amendment partly amend the original license agreement on specific terms and conditions to, among others (i) reflect the updated supply agreement, (ii) grant NNBL a joint ownership interest in patents rights, (iii) amend responsibility for the pediatric clinical trial, and (iv) make a payment to AEZS.
- On December 7, 2020, we announced that we had entered into an exclusive licensing agreement with Consilient Health Ltd. for the commercialization in Europe and the United Kingdom of macimorelin.
- On May 13, 2021, we announced the commencement of our pivotal Phase 3 safety and efficacy study AEZS-130-P02 (the DETECT-trial) evaluating macimorelin for the diagnosis of childhood-onset growth hormone deficiency (CGHD).
- On January 31, 2022, our partner Er-Kim, a regional specialty pharmaceutical company, announced the signature of an exclusive agreement with Aeterna Zentaris for the distribution and sales of Macrilen® in eight countries, including Turkey, Serbia, and Albania.
- On March 21, 2022, we provided an update for our ongoing pivotal Phase 3 safety and efficacy study AEZS-130-P02 (the DETECT-trial) and noted that site activation and patient enrollment continued to be impacted by the COVID-19 pandemic. Additionally, clinical trial sites originally planned in the Ukraine and Russia were halted due to the Russian invasion.
- On April 19, 2022, we announced that European Patent Office had issued a patent providing intellectual property protection of macimorelin in 27 countries within the European Union as well as additional European non-EU countries.
- On May 25, 2022, we announced that Ghryvelin™ (macimorelin) was now available to healthcare professionals across Europe (subject to reimbursement).
- On August 29, 2022, Aeterna Zentaris announced that Novo Nordisk Healthcare AG had exercised its right to terminate the amended development and commercialization license agreement. Following Novo's 270-day notice period, Aeterna will regain full U.S. and Canadian rights to the product.

Macrilen™ (macimorelin) Clinical Program

On January 28, 2020, we announced the successful completion of patient recruitment for the first pediatric study of macimorelin as a growth hormone stimulation test for the evaluation of GHD in children. This study, AEZS-130-P01 ("Study P01"), was the first of two studies as agreed with the EMA in our Pediatric Investigation Plan (the "PIP") for macimorelin as a GHD diagnostic. Macimorelin, a ghrelin agonist, is an orally active small molecule that stimulates the secretion of growth hormone from the pituitary gland into the circulatory system. The goal of Study P01 was to establish a dose that can both be safely administered to pediatric patients and cause a clear rise in growth hormone concentration in subjects ultimately diagnosed as not having GHD. The recommended dose derived from Study P01 will be evaluated in the pivotal second study, Study P02, on diagnostic efficacy and safety. Study P01 was an international, multicenter study, which was conducted in Hungary, Poland, Ukraine, Serbia, Belarus and Russia. Study P01 was an open label, group comparison, dose escalation trial designed to investigate the safety, tolerability, and pharmacokinetic/pharmacodynamic ("PK/PD") of macimorelin acetate after ascending single oral doses of macimorelin at 0.25, 0.5, and 1.0 milligram per kilogram body weight in pediatric patients from 2 to less than 18 years of age with suspected CGHD. We enrolled a total of 24 pediatric patients across the three cohorts of the study. Per study protocol, all enrolled patients completed four study visits after successful completion of the screening period. At Visit 1 and Visit 3, a provocative growth hormone stimulation test was conducted according to the study sites' local practices. At Visit 2, the macimorelin test was performed, and following the oral administration of the macimorelin solution, blood samples were taken at predefined times for PK/PD assessment. Visit 4 was a safety follow-up visit at study end.

The final study results from Study P01 were published in the second quarter of 2020 indicating positive safety and tolerability data for use of macimorelin in CGHD, as well as PK/PD data observed in a range as expected from the adult studies.

On April 7, 2020 the Company announced the decision of the EMA to accept our modification request of our PIP as originally approved in March 2017, which covered the conduct of two pediatric studies and defined relevant key elements in the outline of these studies. We believe this EMA decision supports the development of one globally harmonized study protocol for test validation, specifically

Study P02, which we expect to be accepted both in Europe and the U.S.

In late 2020, we entered into the start-up phase for the clinical safety and efficacy study, AEZS-130-P02 (“DETECT-trial”), evaluating macimorelin for the diagnosis of CGHD. The DETECT-trial is an open-label, single dose, multicenter and multinational study expected to enroll approximately 100 subjects worldwide, with at least 40 pre-pubertal and 40 pubertal subjects, and a minimum of 25 subjects expected to be enrolled in the U.S. The study design is expected to be suitable to support a claim for potential stand-alone testing, if successful. In addition, under the Novo Amendment, Novo and Aeterna agreed that Novo will fund DETECT-trial costs up to \$9.6 million (€9 million), which includes reimbursement of Aeterna’s relevant budgeted internal labor costs. Any additional external jointly approved DETECT-trial costs incurred over \$9.6 million (€9 million) will be shared equally between Novo and Aeterna. On April 22, 2021, the U.S. FDA Investigational New Drug Application associated with this clinical trial became active, (see: <https://clinicaltrials.gov/ct2/show/NCT04786873>), and on May 13, 2021, we announced the opening of the first clinical site in the U.S.

On January 26, 2022, the Company announced that it had experienced unavoidable delays in site initiation and patient enrollment due to the rise of the Omicron variant in the COVID-19 pandemic. Our team has diligently worked to get more clinical sites up and running with the goal of building momentum and bringing this study across the finish line while navigating as best as possible through this challenge. We have engaged a contract research organization (“CRO”) to conduct the DETECT-trial in the United States and in various European countries, including Russia and Ukraine, where, in February 2022, due to the Russian invasion of Ukraine, the clinical trial activities were halted. Consequently, no patients have been enrolled in either of these countries’ clinical sites to date. Russia’s invasion of Ukraine has impacted our ability to conduct our trial in the region.

On August 26, 2022, the Company announced it will regain full rights to Macrilen™ for the U.S. and Canada territories, following Novo’s termination of the development and commercialization license agreement, which triggered a 270-day notice period. Novo will continue to fund DETECT-trial costs up to \$9.6 million (€9 million), which includes reimbursement of Aeterna’s relevant budgeted internal labor costs. Any additional DETECT-trial costs incurred over \$9.6 million (€9 million) up to \$10.5 million (€9.8 million) will be shared equally between Novo and Aeterna. The Company is actively engaged in exploring all options for Macrilen™.

On January 17, 2023, the company provided a business update, highlighting that bolstered enrollment was expected by the replacement of inactive countries/sites and engagement of an additional Clinical Research Organization (CRO). Currently, four new countries (Armenia, Slovakia, Greece, and Turkey) have ongoing DETECT clinical trial application activities, with clinical trial approvals assumed in the first half of 2023. Enrollment completion was announced to be expected by the end of 2023. Management’s current estimated impacts of delays and higher-than-expected costs related to Macrilen’s™ pediatric clinical development due to both COVID-19 and the Russia invasion of Ukraine are discussed further below.

Macimorelin Pre-clinical Program: Ghrelin agonist in development for the treatment of amyotrophic lateral sclerosis (Lou Gehrig’s disease)

On January 13, 2021, we entered into a material transfer agreement with Queensland University to provide macimorelin for the conduct of preclinical and clinical studies evaluating macimorelin as a therapeutic for the treatment of ALS. ALS is a rare progressive neurological disease primarily affecting the neurons controlling voluntary movement, leading to the disability to control movements such as walking, talking, and chewing. Most people with ALS die from respiratory failure, usually between 3-5 years after diagnosis. Currently there is no cure for ALS and no effective treatment to halt or reverse the progression of the disease. Ghrelin is a hormone with wide-ranging biological actions, most known for stimulating growth hormone release, which is demonstrating emerging evidence as therapeutic for ALS. As a ghrelin agonist, macimorelin has the potential as a treatment for ALS, which is evaluated in this research collaboration.

The University of Queensland researchers have filed for supportive grants to conduct such clinical studies. In July 2022, the Company entered into a research and option to license agreement with UniQuest Pty Ltd., the commercialization company of The University of Queensland (UQ), Brisbane, Australia, to advance the development of macimorelin as a potential therapeutic for the treatment of ALS. The Company made substantial progress in the development of a suitable, alternative formulation for use in ALS and is continuing to evaluate AEZS-130 in transgenic mouse ALS models to demonstrate the therapeutic potential of macimorelin in this indication. Our next steps include completion of the ongoing toxicology and safety studies to support treatment over prolonged periods, and following potential achievement of proof-of-concept, scientific advice with regulatory authorities to discuss program development next steps.

Macimorelin Commercialization Program

Novo is currently marketing macimorelin in the U.S. under the tradename Macrilen™ for the diagnosis of AGHD and most recently in accordance with the Novo Amendment, pursuant to which the Company agreed to grant to Novo additional rights with respect to ownership of the Aeterna Patent Rights and Trademarks, as defined, and to amend certain responsibilities between Aeterna and Novo with respect to the ongoing development initiatives for the use of Macrilen™ as a diagnostic in the pediatric indication (the “Pediatric Indication”). Additionally, the Novo Amendment: reflected the existence of a supply agreement; established total consideration to be provided by Novo as reimbursements for costs incurred in connection with the development activities related to the Pediatric Indication; provided for a non-refundable upfront payment of \$6.1 million (€5.0 million) to be made by Novo to the Company; and modified future payment obligations, including a reduction of royalty rates and a waiver by the Company with respect to the \$5 million pediatric milestone from the original agreement with Novo.

As for the reduction in royalties, the Company agreed to reduce the Net Sales Royalties from 15% to 8.5% for annual net sales of Macrilen™ up to \$40 million and to establish a royalty of 15% for annual net sales of Macrilen™ over \$40 million.

Following the termination of the Novo Amendment, pursuant to the terms of the Novo Amendment, Novo is required to continue to fulfil its obligations during the 270-day notice period which ends on May 23, 2023. The Company plans to engage in efforts to explore all options for Macrilen™.

On December 7, 2020, the Company entered into an exclusive licensing agreement with Consilient Health Limited (“CH” or “Consilient”) for the commercialization of macimorelin in the European Economic Area and the United Kingdom. In December 2021, the Department of Health and Social Care in the United Kingdom approved a list price which triggered a \$226 (€0.2 million) pricing milestone payment from CH to the Company. In Germany, a list price was approved on June 15, 2022 which triggered a second \$226 (€0.2 million) pricing milestone payment from CH to the Company. We shipped initial batches of macimorelin (Ghryvelin®) to Consilient in the first quarter of 2022. Consilient launched the product meanwhile in the United Kingdom, Sweden, Denmark, Finland, Germany and Austria. More EU countries will follow pending re-imbursement negotiations. On April 19, 2022, we announced that European Patent Office had issued a patent providing intellectual property protection of macimorelin in 27 countries within the European Union as well as additional European non-EU countries, such as the UK and Turkey, for macimorelin (Ghryvelin®; Macrilen™) for use to diagnose GHD in adults. On March 15, 2023, with the Company’s consent, Consilient Health entered into an assignment agreement to transfer the current licensing agreement for the commercialization of macimorelin in the European Economic Area and the United Kingdom to Atnahs Pharma UK Limited (“Pharmanovia”). The Company also entered into an exclusive supply agreement with Pharmanovia, pursuant to which the Company agreed to provide the Licensed Product to Pharmanovia.

On June 25, 2020, we announced that we entered into an exclusive distribution and related quality agreement with MegaPharm Ltd., a leading Israel-based biopharmaceutical company, for the commercialization in Israel and in the Palestinian Authority of macimorelin, to be used in the diagnosis of patients with AGHD and in clinical development for the diagnosis of CGHD. Under the terms of the agreement, MegaPharm Ltd. will be responsible for obtaining registration to market macimorelin in Israel and the Palestinian Authority, while the Company will be responsible for manufacturing, product supply, quality assurance and control, regulatory support, and maintenance of the relevant intellectual property. In June 2021, MegaPharm Ltd. filed an application to the Ministry of Health of Israel for regulatory approval of macimorelin in Israel, which was approved in November 2022.

We entered into license and supply agreements with NK Meditech Ltd. (“NK”), a subsidiary of PharmBio Korea, effective November 30, 2021, and a distribution and commercialization agreement with ER Kim Pharmaceuticals Bulgaria EOOD (“ER-Kim”), effective February 1, 2022. The agreements with NK are related to the development and commercialization of macimorelin for the diagnosis of AGHD and CGHD in the Republic of Korea, while the agreement with ER-Kim is related to the commercialization of macimorelin for the diagnosis of growth hormone deficiency in children and adults in Turkey and some non-European Union Balkan countries.

Pipeline Expansion Opportunities

Delayed Clearance Parathyroid Hormone (“DC-PTH”) Fusion Polypeptides: Potential treatment for chronic hypoparathyroidism

On March 11, 2021, the Company entered into an exclusive license agreement with The University of Sheffield, United Kingdom, for the intellectual property relating to PTH fusion polypeptides covering the field of human use, which will initially be studied by Aeterna for the potential therapeutic treatment of chronic hypoparathyroidism (“HypoPT”). Under the terms of the exclusive patent and know-how license agreement entered into with the University of Sheffield, Aeterna obtained worldwide rights to develop, manufacture and commercialize PTH fusion polypeptides covered by the licensed patent applications for all human uses for an up-front cash payment, and milestone payments to be paid upon the achievement of certain development, regulatory and sales milestones, as well as low single digit royalty payments on net sales of those products and certain fees payable in connection with sublicensing. Aeterna will be responsible for the further development, manufacturing, approval, and commercialization of the licensed products. Aeterna has also engaged the University of Sheffield under a research contract to conduct certain research activities to be funded by Aeterna, the results of which will be included within the scope of the license granted to Aeterna.

The researchers at the University of Sheffield have developed a method to increase the serum clearance time of peptides, which the Company is applying to the development of a treatment for HypoPT. HypoPT is an orphan disease where the PTH level is abnormally low or absent, with a prevalence per 100,000 of 37 in the U.S., 22 in Denmark, 9.4 in Norway, and 5.3 to 27 in Italy. Standard treatment is calcium and vitamin D supplementation. In consultation with The University of Sheffield, Aeterna has selected AEZS-150 as the lead candidate in its DC-PTH program. AEZS-150 is being developed to provide a weekly treatment option of chronic hypoparathyroidism in adults. Recent progress includes the successful verification and reproduction of previous in-vivo data from the University of Sheffield, in a rat model of hypoparathyroidism, as well as ongoing development of the manufacturing process for AEZS-150 with the Company’s contract development and manufacturing organization, progressing toward establishment of a master cell bank for a cell line expressing AEZS-150 and a process suitable for larger scale GMP manufacturing. Our next steps include working with The University of Sheffield to conduct in depth characterization of development candidate (*in-vitro* and *in-vivo*); the establishment of a master cell bank for a cell line expressing AEZS-150, and formalizing the pre-clinical development of AEZS-150 in preparation for a potential IND filing for conducting the first in-human clinical study.

AIM Biologicals: Targeted, highly specific autoimmunity modifying therapeutics for the potential treatment of neuromyelitis optica spectrum disorder and Parkinson’s disease

In January 2021, Aeterna entered into an exclusive patent license and research agreement with the University of Wuerzburg, Germany, for worldwide rights to develop, manufacture, and commercialize AIM Biologicals for the potential treatment of NMOSD. Additionally, the Company has engaged Prof. Dr. Joerg Wischhusen from the University Hospital in Wuerzburg as well as neuro-immunologist Dr. Michael Levy from the Massachusetts General Hospital in Boston as consultants for scientific support and advice in the field of inflammatory central nervous system “CNS” disorders, autoimmune diseases of the nervous system, and NMOSD. In September 2021, the Company entered into an additional exclusive license with the University of Wuerzburg for early pre-clinical development towards the potential treatment of Parkinson’s disease. On May 12, 2022 the Company announced positive pre-clinical results in an innovative mouse model of Parkinson’s disease, where treatment with α -Synuclein specific AIM Biologicals showed a trend towards improved motoric function, as well as significant induction of regulatory T cells and rescue of substantia nigra neurons.

The data were presented at IMMUNOLOGY2022™, the annual event of the American Association of Immunologists, held on May 6-10, 2022 in Portland, Oregon. On June 13, 2022 the Company announced that it achieved proof-of-concept for the treatment of NMOSD in both *in-vitro* and in mouse models. These findings were presented at the 13th International Congress on Autoimmunity on June 10-13, 2022 in Athens, Greece. In October 2022, the Company entered into a research and development agreement with Massachusetts General Hospital (MGH) in Boston and Dr. Michael Levy, to conduct pre-clinical *ex-vivo* and *in-vivo* studies in NMOSD.

AIM Biologicals is based on a natural process during pregnancy, which induces immunogenic tolerance of the maternal immune system to the partially foreign fetal antigens. Fetal proteins are processed and presented on certain immunosuppressive major histocompatibility complex class I molecules to induce this tolerance. In an autoimmune disease the immune system is misdirected and targets the body's own protein. With AIM Biologicals, we aim to restore the tolerance against such proteins to treat autoimmune diseases.

NMOSD is an autoimmune disease targeting the protein aquaporin 4, primarily found in optic nerves and the spinal cord. The disease leading to blindness and paralysis has a prevalence of 0.7-10 in 100,000, more common in persons with Asian or African compared to European ancestors, and nine times more prevalent among women compared to men. NMOSD progresses in often life-threatening relapses, which are aggressively treated with high-dose steroids and plasmapheresis. Our pre-clinical plans include expanding the already available proof-of-concept data for the treatment of NMOSD in both *in-vitro* and *in-vivo* assessments to select an AIM Biologicals-based development candidate; and manufacturing process development for the selected candidate.

Parkinson's disease is a neurological disease commonly associated with motoric problems with a slow and fast progression form. It is the second most common neurodegenerative disease affecting 10 million people worldwide. The hallmark of PD is the neuronal inclusion of mainly α -synuclein protein (α Syn) associated with the death of dopamine-producing cells. Dopaminergic medication is the mainstay treatment of PD symptoms, but currently there is no pharmacological therapy to prevent or delay disease progression leading to alternate treatments, such as deep brain stimulation with short electric bursts, being investigated for the treatment of symptoms. For the development of AIM Biologicals as potential PD therapeutics, Aeterna plans to utilize, among others, an innovative animal model on neurodegeneration by α -synuclein-specific T cells in AAV-A53T- α -synuclein Parkinson's disease mice, which has recently been published by University of Wuerzburg researchers. We are continuing *in-vitro* and *in-vivo* testing of antigen-specific AIM Biologicals candidate molecules for the potential treatment of Parkinson's disease.

Bacterial Vaccine Platform: Orally active, live-attenuated bacterial vaccine platform with potential application against viruses and bacteria, such as coronaviruses and chlamydia bacteria

The COVID-19 vaccine landscape has continued to evolve profoundly in the past two years. There are highly effective vaccines available, an increasing number of therapeutic options are meanwhile approved or in later stage development and less lethal virus variants are spreading, all of which increase the financial risk associated with any early stage COVID-19 vaccine program. In order to ensure we are prudent with the use of resources, given the early stage of the Company's vaccine development programs and the changes in the global situation, Aeterna has decided that it will not pursue further development of the vaccine platform for either COVID-19 or Chlamydia (which was based on the same vaccine platform as used in the Company's COVID-19 program). As a result, the Company has also elected to terminate its existing license agreements with the University of Wuerzburg for that vaccine platform technology.

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 17.

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.

Regulation of Drug Development

Generally. Governmental authorities in the U.S., 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 U.S., 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 Practice ("**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 U.S., 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 U.S., 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 review 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 CRO 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. The manufacturing process, which must be compliant with GMP, and the 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 replicates 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 the 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 thirty (30) days before starting a clinical trial to allow the FDA time to review the prospective study. If the 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 (approx. 300-3,000 volunteers who have the disease or condition) 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 (an "**NDA**") or, in the case of a biologic, a Biologics License Applications (a "**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.

FDA provides *incentives*, such as orphan drug designation or pediatric exclusivity. 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 that was previously granted the designation for the same indication. We have been granted orphan drug designations for Macrilen™ (macimorelin) for the evaluation of GHD.

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 ("**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. As long as the requirements are fulfilled and the fees are paid to FDA the product can stay on the market, there is no renewal procedure.

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 U.S., which are described above.

The European Union. Medicines can be authorized in the EU by using either the centralized authorization procedure (CP), 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 EC that is valid across the EU, as well as Iceland, Liechtenstein, and Norway. The centralized procedure is mandatory for human medicinal products containing a new active substance for the treatment of HIV/AIDS, cancer, diabetes, neurodegenerative diseases, autoimmune diseases, other immune dysfunctions, viral diseases, or that are designated as orphan medicinal products. In addition, the CP is required for product types derived, for example, from biotechnological processes or genetic engineering. 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 two national 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 and result in a national marketing authorization:

- 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. After mutual approval national authorizations will be granted separately by each member state involved. 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.
- National procedure. If approval is sought independently in only one country, the application for marketing authorization is addressed directly to the competent authority of the member state.

Similar to the U.S., the EMA provides *incentives* for the development of orphan drugs or for pediatrics. Orphan designation is granted for diseases affecting less than 5 in 10,000 people in the EU. With the designation, the sponsor benefits from prolonged market exclusivity (10 years) and fee reductions.

The pediatric regulation grants pediatric development with a six-month extension of the supplementary protection certificate.

The EU marketing authorization is valid for five years and is renewable upon application by the MAH. After the renewal the approval is permanently valid.

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 the 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 websites 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 six owned and in-licensed patent families (issued, granted or pending in the U.S., 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.”

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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 U.S., 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, we expect to apply for patent term extensions on patents covering those products, outside the U.S. 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 U.S., 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 a NCE 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, a NCE 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 (CNRS), as licensor, and AEZS Germany, as licensee. The obligation to pay royalties on net sales to CNRS expired in 2022. Macrilen™ is the approved trademark for macimorelin as licensed under the License Agreement for commercialization in the U.S. and Canada.

The following patents and patent applications relate to macimorelin:

- U.S. patent 8,192,719 covers a method of assessing pituitary-related GHD 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 GHD. This patent expires in October 2027.

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- European patent 1,984,744 covers a method of assessing pituitary-related GHD by oral administration of macimorelin. This patent expires in February 2027.
- Japanese patent 4,852,728 covers a method of assessing pituitary-related GHD by oral administration of macimorelin. This patent expires in February 2027.
- Based on the European patent 1,289,951 a request for supplementary protection certificate (SPC) of 5 years has been granted for Germany, United Kingdom, France, Italy, Spain, The Netherlands and Denmark.

An invention has been made by inventors of AEZS Germany to use a macimorelin containing composition for the assessment of GHD in adults.

- A related 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 GHD comprising oral administration of a macimorelin containing composition and collecting one or two post-administration samples.
- The non-provisional U.S. application 15/993,507 was filed on May 30, 2018 drawing the priority of both provisional applications. The related U.S. patent 10,288,629 was granted on May 14, 2019, and will expire on May 30, 2038. A Patent Cooperation Treaty ("PCT") PCT/EP/2018/085622 application was filed December 18, 2018 drawing the priority of both provisional U.S. applications. In addition to the method of assessing GHD 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 GHD using three post-administration samples. On February 24, 2022, following examination of European patent application 18827044.1, a European patent with the title "Method of assessing growth hormone deficiency comprising oral administration of a macimorelin containing composition and collecting one or two post-administration samples" has been granted. The patent will be published in European Patent Bulletin on March 23, 2022. The European patent covers the use of macimorelin according to the label approved by EC to diagnose GHD in adults. The European patent is in the validation process in 12 European countries. In 29 European countries the patent has been nationalized.

An invention has been made by inventors of AEZS Germany to use a macimorelin containing composition for the assessment of GHD in children. The invention is directed to a method comprises providing at least one blood sample, taken from a subject within a range from about 15 to about 100 minutes following an administration of a sufficient amount of macimorelin to induce growth hormone secretion, measuring the growth hormone level of each blood sample and compare the level with a single threshold value to carry out the diagnosis GHD. The method of the invention is a stand-alone test.

- A related U.S. provisional application Serial No. 63/054,889 was filed July 22, 2020 for the use of macimorelin in assessing growth hormone deficiency in children.
- A non-provisional U.S. application named "Use of macimorelin in assessing growth hormone deficiency in children" with docket number 17/375,709 was filed on July 14, 2021, drawing the priority of the provisional application.
- An international PCT application with docket number PCT/EP2020/070691 was filed on July 22, 2020. Based on the PCT application several national applications have been filed in due time.

Patent applications related to the pipeline expansion opportunities and covered by the individual Patent and License Agreements between AEZS Germany and licensors.

- Delayed Clearance Parathyroid Hormone (DC-PTH) Fusion Polypeptide for the treatment of hypoparathyroidism in adults
- A priority patent application with docket number GB 1706781.0 has been filed by our licensor The University of Sheffield on April 27, 2017. The patent application provides long-acting parathyroid hormone like fusion polypeptides comprising a receptor polypeptide and its use in the treatment of hypoparathyroidism and osteoporosis. An international PCT application named "Parathyroid Hormone Fusion Polypeptide" with docket number PCT/GB2018/051120 was filed April 27, 2018. A national U.S. application with docket number 16/608,611 has been filed on October 25, 2019 and was published as US 2020/0164033A1 on May 28, 2020. The related U.S. patent US 11,344,607 has been granted on May 31, 2022.

AIM Biologicals: Targeted, highly specific autoimmunity modifying therapeutics

- Our licensor the University of Wuerzburg has filed a priority patent application with docket number EP 17172444.6 on May 23, 2017. The invention relates to targeted immunomodulatory effects of defined peptides in combination with proteins comprising one or more domains of a non-classical MHC class 1b molecules or in combination with molecules that interfere with the interaction of MHC class 1b molecules and their receptors. An international PCT application named "Combinations of MHC class 1b molecules and peptides for targeted therapeutic immunomodulation" with docket number PCT/EP2018/063100 has been filed on May 18, 2018. The application was published as WO 2018/215340 A1 on November 29, 2018. A national U.S. application with docket number 16/615,188 has been filed on November 20, 2019 and was published as US 2020/0157175A1 on May 21, 2020.
- Our licensor the University of Wuerzburg has filed a priority patent application with docket number EP 22164161.6 on March 24, 2022. The patent application provides therapeutic proteins for MHC Ib-mediated aquaporin 4 (AQP4)-specific immunosuppression as a novel treatment for neuromyelitis optica spectrum disorder (NMOSD).
- Our licensor the University of Wuerzburg has filed a priority patent application with docket number EP 22164123.6 on March 24, 2022. The invention relates to therapeutic uses of MHC class Ib molecules in combination with peptide antigens for the treatment of Parkinson's disease.

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, 2022 is depicted in the chart set forth under the caption "Item 4.A. History and development of the Company".

D. Property and equipment

Our registered address is located in Toronto, Canada. Our largest office is located in Frankfurt, Germany and we have an additional office in Summerville, South Carolina. We do not own any real property. Effective September 30, 2022, the Company and its landlord mutually agreed to a one-year plus 6 months' notice extension to its existing building lease agreement for its German subsidiary, continuing such terms until March 31, 2024.

The following table sets forth information with respect to our main facilities as at December 31, 2022.

Location	Use of space	Square Footage	Type of interest
315 Sigma Drive, Summerville SC 29486	Occupied for administration	168	Leasehold
Weismüllerstr. 50 D-60314 Frankfurt-am-Main, Germany	Occupied for management, R&D, business development and administration	7,319	Leasehold

We believe that our current facilities are adequate to meet our ongoing needs.

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Item 4A Unresolved Staff Comments

Not required.

Item 5. Operating and Financial Review and Prospects

Key Developments

A. Operating Results

Consolidated Statements of Financial Position Data

	As at December 31,		
	2022	2021	2020
	\$	\$	\$
<i>(in thousands)</i>			
Cash and cash equivalents	50,611	65,300	24,271
Trade and other receivables and other current assets	4,648	5,447	3,322
Inventory	229	73	21
Restricted cash equivalents	322	335	338
Property and equipment	216	192	179
Other non-current assets	—	8,755	8,874
Total assets	56,026	80,102	37,005
Payables and accrued liabilities and income taxes payable	3,936	2,787	2,322
Current portion of provisions	45	34	92
Current portion of deferred revenues	2,949	4,815	2,193
Lease liabilities	179	161	184
Non-financial non-current liabilities ⁽¹⁾	13,141	19,319	19,003
Total liabilities	20,250	27,116	23,794
Shareholders' equity	35,776	52,986	13,211
Total liabilities and shareholders' equity	56,026	80,102	37,005

⁽¹⁾ Comprised mainly of employee future benefits, deferred gain, non-current portion of deferred revenues and provisions.

Recent Accounting Pronouncements

IFRS Pronouncements issued but not yet effective

Certain new accounting standards, amendments to accounting standards and interpretations have been published that are not mandatory for December 31, 2022 reporting periods and have not been early adopted by the Company. These standards, amendments or interpretations are not expected to have a material impact on the entity in the current or future reporting periods and on foreseeable future transactions.

Financial Risk Factors and Other Instruments

The nature and extent of our exposure to risks arising from financial instruments, including credit risk, liquidity risk and market risk and how we manage those risks are described in Note 24 to our audited consolidated financial statements as of December 31, 2022 and 2021 and for the years ended December 31, 2022, 2021 and 2020, which are included in Item 17 – “Financial Statements” in this Annual Report on Form 20-F.

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Results of operations

Consolidated Statements of Loss and Comprehensive Loss Information

(in thousands)	Three months ended December 31,		Years ended December 31,		
	2022	2021	2022	2021	2020
	\$	\$	\$	\$	\$
Revenues	2,485	956	5,640	5,260	3,652
Operating expenses					
Cost of sales	51	18	157	90	2,317
Research and development	4,425	1,863	12,506	6,574	1,506
Selling, general and administrative	2,012	2,206	8,230	7,267	5,893
Gain on modification of building lease	—	—	—	—	(219)
Impairment of intangible assets	584	—	584	—	—
Impairment of goodwill	7,642	—	7,642	—	—
(Reversal of) impairment of other assets	124	—	124	—	(139)
Total operating expenses	14,838	4,087	29,243	13,931	9,358
Loss from operations	(12,353)	(3,131)	(23,603)	(8,671)	(5,706)
Gains (loss) due to changes in foreign currency exchange rates	(98)	257	879	215	572
Change in fair value of warrant liability	—	—	—	—	1,147
Other finance costs	—	—	(3)	(21)	(736)
Net finance income (costs)	(98)	257	876	194	983
Loss before income taxes	(12,451)	(2,874)	(22,727)	(8,477)	(4,723)
Income tax (expense) recovery	—	(20)	—	109	(395)
Net loss	(12,451)	(2,894)	(22,727)	(8,368)	(5,118)
Basic and diluted loss per share	(2.56)	(0.63)	(4.68)	(1.82)	(3.11)

Revenues

We generate revenue from license and collaboration agreements with customers (license fees, milestone revenue, royalties), the provision of development services, the sale of certain active pharmaceutical ingredients ("API"), semi-finished goods and finished goods, and from certain supply chain activities, which are comprised largely of oversight or supervisory support services related to stability studies or development activities carried out with respect to API batch production as specified in underlying contracts with customers.

(in thousands)	Three months ended December 31,			
	2022	2021	Change	Change
	\$	\$	\$	%
Revenues				
License fees	873	361	512	142%
Development services	1,526	528	998	189%
Royalty income	44	21	23	110%
Supply chain	42	46	(4)	-8%
Total revenues	2,485	956	1,529	160%

Our total revenue for the three-month period ended December 31, 2022 was \$2.5 million as compared to \$1.0 million for the same period in 2021, representing an increase of \$1.5 million, primarily due to \$0.5 million increase in License fees and \$1.0 million increase in Development services with Novo.

(in thousands)	Twelve months ended December 31,			
	2022	2021	Change	Change
	\$	\$	\$	%
Revenues				
License fees	1,704	1,670	34	2%
Development services	3,617	3,337	280	8%
Product sales	57	—	57	100%
Royalty income	101	68	33	49%
Supply chain	161	185	(24)	-13%
Total revenues	5,640	5,260	380	7%

Our total revenue for the twelve-month period ended December 31, 2022 was \$5.6 million as compared to \$5.3 million for the same period in 2021, representing an increase of \$0.3 million, primarily due to \$0.3 million increase in development services with Novo.

Research and development expenses

The following table summarizes our research and development expenses incurred during the periods indicated (amounts in thousands, except percentages):

QUARTER ENDED DECEMBER 31,

(in thousands)

	2022	2021	CHANGE	CHANGE
	\$	\$	\$	%
Macrilen™ (macimorelin) pediatric trial (DETECT-trial) direct research and development expenses	1,297	526	771	147%
AEZS-130 direct research and development expenses	1,004	143	861	602%
DC-PTH direct research and development expenses	697	63	634	1,006%
Parkinsons direct research and development expenses	155	171	(16)	-9%
Covid-19 direct research and development expenses	222	137	85	62%
NMOSD direct research and development expenses	320	106	214	202%
Chlamydia direct research and development expenses	295	108	187	173%
Additional programs' direct research and development expenses	27	249	(222)	-89%
Total direct research and development expenses	4,017	1,503	2,514	167%
Employee-related expenses	311	335	(24)	-7%
Facilities, depreciation, and other expenses	97	25	72	288%
Total	4,425	1,863	2,562	138%

Research and development expenses increased by \$2.6 million for the quarter ended December 31, 2022 compared to the quarter ended December 31, 2021 primarily driven by a \$2.5 million increase in direct research and development expenses. Direct research and development expenses include expenses incurred under arrangements with third parties, such as a contract research organization for the DETECT-trial, contract manufacturers, and consultants. The \$2.5 million increase in total direct research and development expenses for the quarter ended December 31, 2022 was primarily due to a \$0.8 million increase in costs for the DETECT-trial and a \$1.7 million increase in the expenses of our new pre-clinical projects with universities. In addition, during the quarter ended December 31, 2022, the Company ceased its development of both the COVID-19 and Chlamydia vaccine trials. The previously capitalized upfront payments for licenses relating to these two trials of \$212 was fully impaired as discussed further below.

In the fourth quarter of 2022, the Company has seen a significant increase in the recruitment of patients for the DETECT-trial leading to the increase in cost from the previous year, when the company was primarily focused on establishing testing sites for patient enrollment in the DETECT-trial. In addition to the DETECT-trial, the Company was actively working with its university research partners on the named pre-clinical programs. The increase in spend on these projects from the prior year is primarily driven by the advancement of these projects, in particular the AEZS-150 and DC-PTH projects which were in licensed in 2021.

The following table summarizes our research and development expenses incurred during the periods indicated (amounts in thousands, except percentages):

	YEAR ENDED DECEMBER 31,			
	2022	2021	\$ CHANGE	CHANGE
	\$	\$	\$	%
Macrilen™ (macimorelin) pediatric trial (DETECT-trial) direct research and development expenses	3,818	3,244	574	18%
AEZS-130 direct research and development expenses	2,514	230	2,284	993%
DC-PTH direct research and development expenses	1,999	154	1,845	1,198%
Parkinsons direct research and development expenses	657	171	486	284%
Covid-19 direct research and development expenses	527	712	(185)	-26%
NMOSD direct research and development expenses	637	453	184	41%
Chlamydia direct research and development expenses	623	146	477	327%
Additional programs' direct research and development expenses	262	486	(224)	-46%
Total direct research and development expenses	11,037	5,596	5,441	97%
Employee-related expenses	1,199	839	360	43%
Facilities, depreciation, and other expenses	270	139	131	94%
Total	12,506	6,574	5,932	90%

Research and development expenses increased by \$5.9 million for the year ended December 31, 2022 as compared to the year ended December 31, 2021 primarily driven by a \$5.4 million increase in direct research and development expenses. Direct research and development expenses include expenses incurred under arrangements with third parties, such as a contract research organization for the DETECT-trial, contract manufacturers, and consultants. The \$5.4 million increase in total direct research and development expenses for the year ended December 31, 2022 was primarily due to a \$0.6 million increase in costs for the DETECT-trial and a \$4.8 million increase in expenses related to our new pre-clinical projects with universities for named projects. In 2022, the Company continued to accelerate the opening of new clinical sites and commenced the enrollment of patients in the DETECT-trial, in contrast to 2021 where the Company had not yet commenced patient enrollment. In addition to the DETECT-trial, the Company ran our six pre-clinical projects for the full year, in contrast to prior year when these 6 pre-clinical projects were in licensed during the year. Lastly, during the quarter ended December 31, 2022 the Company ceased its development of both the COVID-19 and Chlamydia vaccine trials. The previously capitalized upfront payments for licenses relating to these two trials of \$212 was fully impaired as discussed further below.

Employee-related expenses have increased in 2022 by \$0.4 million as compared to the year ended December 31, 2021 primarily due to the addition of two senior members to our research and development team.

Facilities, depreciation, and other expenses have increased in 2022 by \$0.1 million as compared to 2021, primarily from higher Consulting and other service related expenses.

Selling, general, and administrative expenses

(in thousands)	Three months ended December 31			
	2022	2021	Change	Change
	\$	\$	\$	%
Salaries & benefits	882	869	13	1%
Insurance	420	406	14	3%
Professional fees	222	310	(88)	-28%
Consulting fees	89	184	(95)	-52%
Other office & general expenses	399	437	(38)	-9%
Total selling, general & administrative expenses	2,012	2,206	(194)	-9%

Our total Selling, general and administrative expenses for the three-month period ended December 31, 2022, were \$2.0 million as compared to \$2.2 million for the same period in 2021 representing a decrease of \$0.2 million. This decrease arose primarily from a \$0.1 million decline in Professional fees and a \$0.1 million decline in Consulting fees.

(in thousands)	Twelve months ended December 31,			
	2022	2021	Change	Change
	\$	\$	\$	%
Salaries & benefits	2,994	2,525	469	19%
Insurance	1,678	1,040	638	61%
Professional fees	1,163	1,207	(44)	-4%
Consulting fees	682	688	(6)	-1%
Other office & general expenses	1,713	1,807	(94)	-5%
Total selling, general & administrative expenses	8,230	7,267	963	13%

Our total Selling, general and administrative expenses for the twelve-month period ended December 31, 2022 were \$8.2 million as compared to \$7.3 million for the same period in 2021, representing an increase of \$1.0 million. This increase arose primarily from a \$0.5 million increase in Salaries and Benefits, a \$0.6 million increase in Insurance expenses offset by a \$0.1 million decrease in other office and general expenses.

Impairment of goodwill & intangible assets

(in thousands)	Three months ended December 31			
	2022	2021	Change	Change
	\$	\$	\$	%
Impairment of goodwill	7,642	—	7,642	100%
Impairment of intangible assets	584	—	584	100%
	8,226	—	8,226	100%

(in thousands)	Twelve months ended December 31			
	2022	2021	Change	Change
	\$	\$	\$	%
Impairment of goodwill	7,642	—	7,642	100%
Impairment of intangible assets	584	—	584	100%
	8,226	—	8,226	100%

During the quarter ended December 31, 2022, the Company ceased its development of both the COVID-19 and Chlamydia vaccine trials. The previously capitalized upfront payments for licenses relating to these two trials of \$212 was fully impaired. In addition, as part of the Company's annual goodwill impairment assessment, the recoverable amount of the group of cash generating units ("CGUs") that goodwill was allocated to was determined based on a fair value less cost of disposal ("FVLCD") model. FVLCD was determined based on a market approach and also derived from market data including information from market participants regarding the price that the Company could receive in a sale of the group of CGUs. Based on the Company's assessment, the recoverable amount of the group of CGUs was lower than the carrying value and therefore an impairment charge was recorded on its goodwill and intangible assets for an amount of \$7,642 and \$372 respectively, as discussed in note 11 of the Company's audited consolidated financial statements.

Net finance income (costs)

For the three-month period ended December 31, 2022, our net finance cost was \$0.1 million as compared to a net finance income of \$0.3 million for the three-month period ended December 31, 2021. This is primarily due to a \$0.3 million decrease in foreign currency gains (loss). Our net finance income for the twelve-month period ended December 31, 2022 was \$0.9 million as compared to \$0.2 million for the same period in 2021, representing an increase of \$0.7 million. This is primarily due to a \$0.7 million increase in gain due to change in foreign currency.

Net loss

For the three-month period ended December 31, 2022, we reported a consolidated net loss of \$12.5 million, or \$2.56 loss per common share (basic and diluted), as compared to a consolidated net loss of \$2.9 million, or \$0.63 loss per common share (basic and diluted) for the three-month period ended December 31, 2021. The \$9.6 million increase in net loss is primarily from a \$10.8 million increase in total operating expenses and a \$0.3 million decrease in net finance income (costs) offset by a \$1.5 million increase in revenues, as discussed above.

For the twelve-month period ended December 31, 2022, we reported a consolidated net loss of \$22.7 million, or \$4.68 loss per common share (basic and diluted), as compared to a consolidated net loss of \$8.4 million, or \$1.82 loss per common share (basic and diluted), for the year ended December 31, 2021. The \$14.3 million increase in net loss is primarily from a \$15.3 million increase in operating expenses, offset by a \$0.3 million increase in total revenues and a \$0.7 million increase in net finance income, as previously discussed.

Selected quarterly financial data

(in thousands, except for per share data)

	Three months ended			
	Dec 31, 2022	Sep 30, 2022	Jun 30, 2022	Mar 31, 2022
	\$	\$	\$	\$
Revenues	2,485	1,860	(222)	1,517
Net loss	(12,451)	(3,420)	(4,216)	(2,640)
Net loss per share (basic and diluted) ⁽²⁾	(2.56)	(0.70)	(0.87)	(0.54)

(in thousands, except for per share data)

	Three months ended			
	Dec 31, 2021	Sep 30, 2021	Jun 30, 2021	Mar 31, 2021
	\$	\$	\$	\$
Revenues	956	1,052	1,584	1,668
Net loss	(2,894)	(1,932)	(2,084)	(1,458)
Net loss per share (basic and diluted) ⁽¹⁾	(0.63)	(0.40)	(0.43)	(0.38)

(1) Net loss per share is based on the weighted average number of shares outstanding during each reporting period, which may differ on a quarter-to-quarter basis. As such, the sum of the quarterly net loss per share amounts may not equal full-year net loss per share.

Historical quarterly results of operations and net loss cannot be taken as reflective of recurring revenue or expenditure patterns of predictable trends, largely given the non-recurring nature of certain components of our revenues, unpredictable quarterly variations in net finance income and of foreign exchange gains and losses.

B. Liquidity, Cash Flows and Resources

Liquidity and capital resources

The Company's objective in managing capital, consisting of shareholders' equity, with cash and cash equivalents being its primary components, is to ensure sufficient liquidity to fund research and development costs, selling expenses, general and administrative expenses and working capital requirements. Over the past several years, we have raised capital via public and private equity offerings and issuances and have entered into licensing and collaborative arrangements, consideration from which, together with proceeds from equity issuances, has been our primary source of liquidity. The capital management objective of the Company remains the same as that in previous periods. The policy on dividends is to retain cash to keep funds available to finance the activities required to advance the Company's product development portfolio and to pursue appropriate commercial opportunities as they may arise. The Company is not subject to any capital requirements imposed by any regulators or by any other external source.

Cash flows

The following table shows a summary of our consolidated cash flows for the periods indicated (amounts in thousands):

(in thousands)

	Years ended December 31,		
	2022	2021	2020
	\$	\$	\$
Cash and cash equivalents - beginning of year	65,300	24,271	7,838
Cash used in operating activities	(13,680)	(8,581)	(4,129)
Cash flows (used in) provided by financing activities	(118)	51,037	20,468
Cash flows (used in) provided by investing activities	(12)	(658)	56
Effect of exchange rate changes on cash and cash equivalents	(879)	(769)	38
Cash and cash equivalents - end of year	50,611	65,300	24,271

Operating activities

Cash used by operating activities totaled \$13.7 million for the twelve months ended December 31, 2022, as compared to \$8.6 million used by operating activities in the same period in 2021. This \$5.1 million increase in spending in operating activities is attributed primarily to increased research and development and general and administrative expenses.

Financing activities

Cash spent on financing activities totaled \$0.1 million for the twelve months ended December 31, 2022, as compared to cash provided by financing activities of \$51.0 million in the same period in 2021. In February 2021, the Company completed a financing which provided \$31.0 million in net funding and throughout 2021, holders exercised 35.1 million warrants resulting in proceeds to the Company of \$20.0 million.

Investing activities

Cash used in investing activities totaled \$0.01 million for the twelve months ended December 31, 2022, as compared to cash provided by investing activities of \$0.7 million in the same period in 2021. The \$0.7 million year-over-year decrease is attributable entirely to upfront payments made to universities under certain license agreements in 2021.

Adequacy of financial resources

Since inception, the Company has incurred significant expenses in its efforts to develop and co-promote products. Our current business focus is to: investigate further therapeutic uses of Macrilen™, expand pipeline development activities, further expand the commercialization of macimorelin in available territories and fund ongoing clinical trial costs. Consequently, the Company has incurred operating losses and has generated negative cash flow from operations and in each of the last several years except for the year ended December 31, 2018 when the Company earned revenue from the sale of a license for the adult indication of Macrilen™ in the U.S. and Canada. The Company expects to incur significant expenses and operating losses for the foreseeable future as it advances its product candidates through preclinical and clinical development, seeks regulatory approval and pursues commercialization of any approved product candidates. We expect that our research and development costs will increase in connection with our planned research and development activities.

As of December 31, 2022, the Company had an accumulated deficit of \$352.0 million. The Company also had a net loss of \$22.7 million and negative cash flows from operations of \$13.7 million for the year ended December 31, 2022. We believe that our existing cash on hand will be sufficient to fund our anticipated operating and capital expenditure requirements for the next 12 months. We plan to finance our future operations and capital expenditures primarily through cash on hand. We also believe that our existing cash on hand will be sufficient to fund our anticipated operating and capital expenditure requirements beyond the next 12 months and through 2025. We have based this estimate on assumptions that may prove to be wrong, and we could exhaust our capital resources sooner than we expect. We may also require additional capital to pursue in-licenses or acquisitions of other product candidates.

Our forecast of the period of time through which our financial resources will be adequate to support our operations is a forward-looking statement that involves risks and uncertainties, and actual results could vary materially as a result of a number of factors. Our future capital requirements are difficult to forecast and will depend on many factors, including:

- the terms and timing of any other collaboration, licensing, and other arrangements that we may establish;
- the initiation, progress, timing, and completion of preclinical studies and clinical trials for our current and future potential product candidates, including the impact of COVID-19 on our ongoing and planned research and development efforts;
- our alignment with the FDA on regulatory approval requirements;
- the impact of COVID-19 on the operations of key governmental agencies, such as the FDA, which may delay the development of our current product candidates or any future product candidates;
- the number and characteristics of product candidates that we pursue;
- the outcome, timing, and cost of regulatory approvals;
- delays that may be caused by changing regulatory requirements;
- the cost and timing of hiring new employees to support our continued growth;
- the costs involved in filing and prosecuting patent applications and enforcing and defending patent claims;
- the costs of filing and prosecuting intellectual property rights and enforcing and defending any intellectual property-related claims;
- the costs of responding to and defending ourselves against complaints and potential litigation;
- the costs and timing of procuring clinical and commercial supplies for our product candidates; and
- the extent to which we acquire or in-license other product candidates and technologies.

Contractual obligations and commitments

The following is a summary of our contractual obligations as of December 31, 2022:

	Service and manufacturing	R&D contracts	TOTAL
	\$	\$	\$
Less than 1 year	9,250	1,577	10,827
1 - 3 years	1,362	218	1,580
4 - 5 years	29	—	29
More than 5 years	—	—	—
	10,641	1,795	12,436

In 2021, the Company executed various agreements including in-licensing and similar arrangements with development partners. Such agreements may require the Company to make payments on achievement of stages of development, launch or revenue milestones, although the Company generally has the right to terminate these agreements at no penalty. The Company may have to pay up to \$38,458 upon achieving certain sales volumes, regulatory or other milestones related to specific products.

Contingencies

In the normal course of operations, the Company may become involved in various claims and legal proceedings related to, for example, contract terminations and employee-related and other matters.

Related Party Transactions and Off-Balance Sheet Arrangements

Other than employment agreements and indemnification agreements with our management, there are no related party transactions.

As of December 31, 2022, we did not have any interests in special purpose entities or any other off-balance sheet arrangements.

Risk Factors and Uncertainties

An investment in our securities involves a high degree of risk. In addition to the other information included in this MD&A and in the related consolidated financial statements, investors are urged to carefully consider the risks described under Item 3, D. – “Risk factors” in this Annual Report on Form 20-F for a discussion of the various risks that may materially affect our business. The risks and uncertainties not presently known to us or that we currently deem immaterial may also materially harm our business, operating results and financial condition and could result in a complete loss of your investment.

Critical Accounting Estimates and Judgments

Our consolidated financial statements as of December 31, 2022 and 2021 and for the years ended December 31, 2022, 2021 and 2020 have been prepared in accordance with IFRS as issued by the IASB.

A detailed discussion of our critical accounting estimates and judgments can be found in Note 3 to our audited consolidated financial statements as of December 31, 2022 and 2021 and for the years ended December 31, 2022, 2021 and 2020, which are included in Item 17 – “Financial Statements” in this Annual Report on Form 20-F. Critical accounting estimates and judgments are those that require significant judgment and/or estimates by management at the time that financial statements are prepared such that materially different results might have been reported if other assumptions had been made. These estimates form the basis for and affect the reported amounts of our assets, liabilities, revenues, expenses and related disclosures. Judgments, estimates and assumptions are based on historical experience, expectations, current trends and other factors that management believes to be relevant when our consolidated financial statements are prepared. Actual results could differ materially from these estimates.

Management reviews, on a regular basis, the Company’s accounting policies, assumptions, estimates and judgments to ensure that the consolidated financial statements are presented fairly and in accordance with IFRS. Revisions to accounting estimates are recognized in the period in which the estimates are revised and in any future periods affected.

The most significant accounting estimates and assumptions that the Company has made in the preparation of our consolidated financial statements include: accounting for a contract modification, license and collaboration arrangement with multiple elements, impairment of goodwill, employee future benefits and research and development accrual.

C. *Research and development, patents and licenses, etc.*

For a description of our R&D policies for the last three years, see “Item 4.B. Business Overview” and “Key Developments” at the beginning of this Item 5. Over the past four years, our research and development activities have encompassed:

- the 2018 initiation of pediatric indication P01 study for Macilen™ (macimorelin) for which Novo paid 70% of the costs;
- the 2021 initiation of the DETECT-trial which Novo will fund all costs up to \$9.6 million (€9 million), and any additional costs incurred over \$9.6 million (€9 million) up to \$10.5 million (€9.8 million) will be shared equally between Novo and the Company until May 2023; and
- our pipeline activities which consist of pre-clinical work.

D. *Trend Information*

Other than as disclosed below and elsewhere in this Annual Report, we are not aware of any trends, uncertainties, demands, commitments, or events that are reasonably likely to have a material effect on our net revenue, income from continuing operations, profitability, liquidity, or capital resources, or that would cause reported financial information not necessarily to be indicative of future operating results or financial condition.

Aeterna is currently conducting its pivotal Phase 3 safety and efficacy study AEZS-130-P02 (the “**DETECT-trial**”) evaluating macimorelin for the diagnosis of CGHD. Children and adolescents from two to less than 18 years of age with suspected growth hormone deficiency are to be included. The study is expected to include approximately 100 subjects in Europe and North America, with at least 40 subjects in pre-pubertal and 40 subjects in pubertal status. Macimorelin growth hormone stimulation test (“**GHST**”) will be performed twice for repeatability data and two standard GHSTs will be used as controls: arginine (IV) and clonidine (orally). On

April 22, 2021, the U.S. FDA Investigational New Drug Application associated with this clinical trial became active. The first clinical sites in the U.S. and in Europe are open for patient recruitment. In Europe, national clinical trial approval procedures and site initiation activities are ongoing. At this point in time, we are closely monitoring delays in site activation and enrollment due to the ongoing COVID-19 pandemic, to mitigate potential impact on estimated trial completion dates.

The Company continues to advance its ongoing business development discussions to secure commercialization partners for macimorelin in additional markets. In addition to its previously established agreements, Aeterna recently entered into a license agreement with NK Meditech Ltd., for the development and commercialization of macimorelin in the Republic of Korea, and a distribution agreement with Er-Kim Pharmaceuticals Bulgaria EOOD for the commercialization of macimorelin in Turkey and some Balkan countries.

For the development of AIM Biologicals as potential PD therapeutics, Aeterna plans to utilize, among others, an innovative animal model on neurodegeneration by α -synuclein-specific T cells in AAV-A53T- α -synuclein Parkinson's disease mice, which has recently been published by University of Wuerzburg researchers.

Next Steps - NMOSD

- Conduct in-vitro and in-vivo assessments to select an AIM Biologicals-based development candidate.
- Manufacturing process development for selected candidate.

Next Steps - Parkinson's Disease

- Design and produce antigen-specific AIM Biologics molecules for the potential treatment of Parkinson's disease.
- Conduct in-vitro and in-vivo assessments in relevant Parkinson's disease models.

In consultation with the University of Sheffield, Aeterna has selected AEZS-150 as the lead candidate in its DC-PTH program. AEZS-150 is being developed with the goal of providing a potential new treatment option of primary hypoparathyroidism in adults.

Next Steps DC-PTH

- Work with the University of Sheffield to conduct in depth characterization of development candidate (in-vitro and in-vivo).
- Develop manufacturing process.
- Formalize pre-clinical development of AEZS-150 in preparation for a potential IND filing for conducting the first in-human clinical study

Apart from already available pre-clinical and clinical data on macimorelin for the development as a diagnostic, Aeterna may utilize the established supply chain to support this development. Alternative formulations are currently also under development, as a further option in addition to the existing oral solution already approved for the diagnostic use in adult growth hormone deficiency (AGHD).

Next Steps - Macimorelin as a Potential Therapeutic (ALS)

- Work with the University of Queensland to conduct proof-of-concept studies with macimorelin in disease-specific animal models.
- Assess alternative formulations.
- Formalize pre-clinical development plan

The COVID-19 vaccine landscape has continued to evolve profoundly in the past two years. There are highly effective vaccines available, an increasing number of therapeutic options are meanwhile approved or in later stage development and less lethal virus variants are spreading, all of which increase the financial risk associated with any early stage COVID-19 vaccine program. In order to ensure we are prudent with the use of resources, given the early stage of the Company's vaccine development programs and the changes in the global situation, Aeterna has decided that it will not pursue further development of the vaccine platform for either COVID-19 or Chlamydia (which was based on the same vaccine platform as used in the Company's COVID-19 program). As a result, the Company has also elected to terminate its existing license agreements with the University of Wuerzburg for that vaccine platform technology.

Financial Risk Factors and Other Instruments

The nature and extent of our exposure to risks arising from financial instruments, including credit risk, liquidity risk and market risk (share price risk) and how we manage those risks are described in note 24 to the Company's annual audited consolidated financial statements as of December 31, 2022 and 2021 and for the years ended December 31, 2022, 2021 and 2020.

The consolidated financial statements filed as part of this Annual Report on Form 20-F are presented under "Item 17. - Financial Statements".

E. Critical Accounting Estimates

See Item 5.B above "Liquidity, Cash Flows and Capital Resources - Critical Accounting Estimates and Judgments".

Item 6. Directors, Senior Management and Employees

A. *Directors and senior management*

The following table sets forth information about our directors and our senior corporate officers as at December 31, 2022:

Name and Place of Residence	Position with Aeterna Zentaris
Ammer, Nicola Hessen, Germany	Senior Vice President Clinical Development, Chief Medical Officer
Edwards, Peter G. Ohio, United States	Director
Egbert, Carolyn Texas, United States	Director, Chair of the Board
Gagnon, Gilles Quebec, Canada	Director
Gerlach, Matthias Hessen, Germany	Senior Vice President Manufacturing and Supply Chain
Guenther, Eckhard Hessen, Germany	Senior Vice President Business Development & Alliance Management; Managing Director AEZS Germany
La Fratta, Giuliano Quebec, Canada	Senior Vice President, Chief Financial Officer
Paulini, Klaus Hessen, Germany	President, Chief Executive Officer, Director; Managing Director AEZS Germany
Turpin, Dennis Quebec, Canada	Director
Teifel, Michael Hessen, Germany	Senior Vice President Non-Clinical Development, Chief Scientific Officer

The following is a brief biography of each of our directors and executive officers.

Nicola Ammer was appointed as our Senior Vice President, Clinical Development and as Chief Medical Officer in January 2021. She serves as one of our executive officers. Dr. Ammer, who is based in the Frankfurt, Germany office of AEZS Germany, began her career in the pharmaceutical medicine environment in the CRO business in 2002 and gained experience in all aspects of clinical research & development in various positions with increasing responsibility, including a Director of Clinical Operations. She joined AEZS Germany in March 2015 as Clinical Program Director and took over the role of the Head of Clinical Development in January 2016. She possesses numerous skills in the area of pharmaceutical medicine and contributed significantly to the successful completion of the macimorelin clinical development program in the adult indication. Dr. Ammer obtained the license to practice medicine in 1995 after completion of her academic studies at the University of Essen. She was awarded a doctorate diploma in medicine by the University of Münster in 2004 and a Master of Science in Pharmaceutical Medicine by the University Duisburg-Essen in 2009.

Peter G. Edwards joined the Board on May 15, 2020 and is a member of the Audit Committee and of the Nominating, Governance and Compensation Committee. Mr. Edwards is currently General Counsel of Aziyo Biologics. Mr. Edwards served as the Executive Vice President and General Counsel of Celanese Corporation from January 2017 to January 2019. Mr. Edwards previously was Executive Vice President and General Counsel of Baxalta Incorporated, the biopharmaceutical spin-off from Baxter, from June 2015 until its merger with Shire plc in July 2016. Before that, he was Senior Vice President and General Counsel of the global specialty pharmaceuticals company Mallinckrodt plc from July 2013 to June 2015 and served as its Vice President and General Counsel from May 2010 to its spin-off from Covidien plc in June of 2013. He previously served as Executive Vice President and General Counsel for Solvay Pharmaceuticals in Brussels, Belgium from June 2007 until April 2010 and as its Senior Vice President and General Counsel in the US from October 2005 to June 2007. Prior to that, he held in-house positions of increasing responsibility within Mettler-Toledo, Inc. and Eli Lilly and Company. Mr. Edwards began his career in 1990 as an associate in the Kansas City, Missouri office of Shook, Hardy & Bacon L.L.P. Mr. Edwards received his J.D., cum laude, from Brigham Young University.

Carolyn Egbert has served as a director on our Board since August 2012 and as Chair of our Board since May 2016. She is also a member of the Nominating, Governance and Compensation Committee. After enjoying the private practice of law as a defense litigator in Michigan and Washington, D.C., she joined Solvay America, Inc. ("**Solvay**") (a chemical and pharmaceutical company) in Houston, Texas. Over the course of a twenty-year career with Solvay, she held the positions of Vice President, Human Resources, President of Solvay Management Services, Global Head of Human Resources and Senior Executive Vice President of Global Ethics and Compliance. During her tenure with Solvay, she served as a director on the board of directors of seven subsidiary companies and as Chair of one subsidiary board. After retiring in 2010, she established Creative Solutions for Executives, a consulting business providing expertise in corporate governance, ethics and compliance, organizational development, executive compensation and strategic human resources. She holds a Bachelor of Sciences degree in Biological Sciences from George Washington University, Washington D.C. and a Juris Doctor degree from Seattle University, Seattle, Washington. She also was a Ph.D. candidate in Pharmacology at both Georgetown University Medical School at Washington, D.C. and Northwestern University Medical School at Chicago, Illinois. She remains an active member of both the Michigan State Bar and the District of Columbia Bar, Washington, D.C.

Gilles Gagnon joined the Board on January 1, 2020 and is a member of the Audit Committee and of the Nominating, Governance and Compensation Committee. Mr. Gagnon is currently the President and Chief Executive Officer of Ceapro Inc., a biotechnology company. Prior to that, he was President and CEO of Aeterna Zentaris Inc. During the past 35 years, Mr. Gagnon has worked at several management levels within the field of health, especially in the hospital environment and pharmaceutical industry. Mr. Gagnon has participated in several international committees and strategic advisory boards. He served nine years on the board of directors of Canada's Research Based Pharmaceutical Companies (Rx&D—now Innovative Medicine Canada) where he represented members from the biopharmaceutical sector and pioneered the Rx&D's Canadian Bio partnering initiative. He currently serves as the President and Chief Executive Officer of Ceapro Inc. He is a member of the CEO Council of Innovative Medicine Canada. He is a certified corporate

Director having completed the Directors Education Program at the Rotman School of Management at the University of Toronto, and he has served on several boards of both private and publicly listed companies in the biopharmaceutical sector.

Matthias Gerlach was appointed as our Vice President, Manufacturing Operations in June 2014 and as Vice President, Manufacturing and Supply Chain in January 2018. He serves as one of our executive officers. From December 2011 through May 2014, he was our Vice President, Medicinal Chemistry. Dr. Gerlach, who is based in the Frankfurt office of AEZS Germany, began his career in the pharmaceutical industry in 1997. He joined our Company in January 2001, assuming roles of increasing responsibility in areas of medicinal chemistry and preclinical development through product commercialization during his career. He possesses numerous scientific and business skills and has a long record of successful innovation, drug development and management, and contributed significantly to the successful U.S.-commercialization of macimorelin in the adult indication. Dr. Gerlach obtained a diploma in Chemistry from the Johann Wolfgang Goethe University in Frankfurt in 1994 and was awarded his doctorate diploma in synthetic organic chemistry by the Johann Wolfgang Goethe University in 1997.

Eckhard Guenther was appointed as Managing Director of Aeterna Zentaris GmbH in January 2020 and Senior Vice President of Business Development & Alliance Management in 2021. Dr. Guenther brings more than 25 years in the pharmaceutical industry, with profound knowledge and expertise in drug discovery and development in various indication areas like oncology and endocrinology. Additionally, over the course of his career, he has gained extensive experience across research coordination, project management, intellectual properties and business development. After receiving his Ph.D. in organic chemistry from the Martin-Luther University of Halle-Wittenberg (Germany), he started his industrial career at Fahlberg-List Magdeburg in 1985. In 1990 he joined ASTA Medica AG in Frankfurt where he worked in the department of Medicinal Chemistry. During his time at ASTA Medica, Dr. Guenther was significantly involved in the preparation and execution for the spin-off of the biotechnology company Zentaris from ASTA Medica. After the founding of Aeterna Zentaris in 2002 he was appointed to Vice President of Drug Discovery and Preclinical Research. In 2008 he was promoted to Vice President Alliance Management & Intellectual Property and in 2014 he became Vice President of Business Development at Aeterna Zentaris. Dr. Guenther was responsible for the initiation and execution of several research and development and licensing deals with midsize and large international pharmaceutical companies, like Consilient Health, MegaPharm Ltd., Schering Pharma, Solvay, Yakult Honsha, Hikma Pharmaceuticals and Sinopharm A-Think. Dr. Guenther is based in Frankfurt, Germany.

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Giuliano La Fratta was appointed as our Senior Vice President, Chief Financial Officer in January 2022. He is a senior financial professional with over 20 years of professional experience in the pharmaceutical, biopharma and financial services sector. During his career, he has served in both the public and private sectors where he has gained significant experience in leading and managing broad financial activities, including M&A transactions, corporate development, auditing, accounting and administrative functions. Prior to joining Aeterna Zentaris, Mr. La Fratta served as the Vice President of Finance at CellCarta (formerly Caprion Biosciences), a private equity-owned specialty Clinical Research and Development Organization laboratory with global operations headquartered in Montreal, Canada. Prior to CellCarta, Mr. La Fratta served in various functions at IMS Canada Health (now Iqvia) and Cato Research. He began his career at Deloitte Touche as a Senior Auditor for both Canadian and American companies across various industries, including the pharmaceutical sector. Mr. La Fratta holds a bachelor's degree in accounting from Concordia University and holds a CPA designation.

Dr. Klaus Paulini was appointed President and Chief Executive Officer of the Company in October 2019 and also serves as a director on our Board. Dr. Paulini is based in Frankfurt, Germany at our subsidiary AEZS Germany, where he was appointed Managing Director in July 2019 and as Vice President Quality and Regulatory in February 2018. Dr. Paulini began his career in the pharmaceutical industry at ASTA Medica AG in 1997. He had an active role when Zentaris was formed and spun out of ASTA Medica and served in various roles with increasing responsibility at the company ever since, including project responsibility for Cetrotide®. As Head of Quality Assurance from 2010 and 2019, Dr. Paulini successfully managed many of our clinical development projects – including Macrilen™/Macimorelin – in the research and development phase as group leader medicinal chemistry. With his extensive experience and knowledge, he provided successful oversight and valuable input for our pharmaceutical and clinical development programs, ensuring successful and compliant outcomes, ultimately leading to regulatory approvals by the U.S. FDA and the EMA. Dr. Paulini obtained his PhD (Dr. Ing.) in chemistry at the Technical University Darmstadt (Germany) in 1993 and specialized in medicinal chemistry/drug discovery during subsequent postdoctoral fellowships at Strathclyde University (Glasgow, Scotland) and J.W. Goethe University (Frankfurt, Germany) before joining ASTA Medica AG.

Dennis Turpin is a seasoned professional executive and chartered accountant (CPA) with significant experience in finance and capital markets transactions, business development and mergers and acquisitions, over 20 years of which has been in the biopharmaceutical industry. He is currently the President and Chief Executive Officer of Endoceutics, Inc., a specialty biopharmaceutical company where he was previously the Vice President, Special Projects. Mr. Turpin was previously the Vice President and Chief Financial Officer of the Quebec Port Authority from February 2016 to June 2018. From 2007 to 2015, Mr. Turpin was the Senior Vice President and Chief Financial Officer of Aeterna Zentaris and, between 2007 and 1996 he held various finance roles with Aeterna Zentaris. Prior to that, he was a Director in the tax department at Coopers Lybrand, now PricewaterhouseCoopers, from 1988 to 1996 and worked as an auditor from 1985 to 1988. Mr. Turpin earned his Bachelor's degree in Accounting from Laval University in Québec. He obtained his license in accounting in 1985 and became a chartered accountant in 1987.

Michael Teifel is a leading industry executive with a career spanning over 20 years in various therapeutic areas, including endocrinology and oncology. He has deep experience in translating research into clinical development. Over the course of his career, he has gained particular expertise in the design and implementation of non-clinical development programs for small molecule drugs, peptides, targeted therapies, and biologics, as well as in the continued non-clinical evaluation of drug candidates for global registration. Dr. Teifel joined Aeterna Zentaris having held various positions in industry with increasing responsibilities in pharmacology, pharmacokinetics, toxicology and translational sciences. He began his career in industry at Roche Diagnostics in the area of delivery systems / non-viral gene therapy. In 1999, Dr. Teifel joined the biotech start-up, Munich Biotech in Martinsried, Germany as a co-founder. As head of pharmacology & toxicology, he was responsible for the evaluation and non-clinical development of a novel vascular targeting technology for the development of anti-tumor diagnostics and therapeutics. In 2004, Dr. Teifel started his first term at Aeterna Zentaris where he held several positions in the field of preclinical development and translational research. In his capacity he was, among others, responsible for preparation of the non-clinical dossier for registration of macimorelin in the U.S. and EU in the indication AGHD. In 2019, Dr. Teifel left Aeterna Zentaris to pursue his career in non-clinical research and development at Cleara Biotech in Utrecht, The Netherlands. As head of translational sciences at Cleara Biotech, he was responsible for translating

research on anti-senescent drugs into pre-clinical development in age-related diseases and late-stage cancer. In May 2021 he re-joined Aeterna Zentaris as Senior Vice-President Non-Clinical Development and Chief Scientific officer. Dr. Teifel holds a degree in biology and his Ph.D. from the Technical University of Darmstadt, Germany.

There are no family relationships between any of the persons named above and no arrangement with any customers, major shareholders, suppliers or others pursuant to which any person above was selected as a director or executive officer. Each director holds office until the Company's next annual general meeting or until a successor is duly elected or appointed.

Board Diversity

The table below provides certain information regarding the diversity of our board of directors as of the date of this Annual Report on Form 20-F.

Board Diversity Matrix

Country of Principal Executive Offices:	Canada
Foreign Private Issuer	Yes
Disclosure Prohibited under Home Country Law	No
Total Number of Directors	5

	Female	Male	Non-Binary	Did Not Disclose Gender
Part I: Gender Identity				
Directors	1	4	—	—
Part II: Demographic Background				
Underrepresented Individual in Home Country Jurisdiction	—	—	—	—
LGBTQ+	—	—	—	—
Did Not Disclose Demographic Background	—	—	—	—

B. Compensation

Our directors and executive officers are generally paid in their home country currency. Unless otherwise indicated, all compensation information included in this document is presented in U.S. dollars and, to the extent a director or officer has been paid in a currency other than U.S. dollars, the amounts have been converted from such person's home country currency to U.S. dollars based on the following annual average exchange rates: for the financial year ended December 31, 2022: €1.000 = U.S.\$1.053 and CAN\$1.000 = U.S.\$0.759; for the financial year ended December 31, 2021: €1.000 = U.S.\$1.182 and CAN\$1.000 = U.S.\$0.797; for the financial year ended December 31, 2020: €1.000 = U.S.\$1.140 and CAN\$1.000 = U.S.\$0.745.

Compensation of Outside Directors

The compensation paid to members of our Board who are not our employees (our "Outside Directors") is designed to (i) attract and retain the most qualified people to serve on the Board and its committees, (ii) align the interests of the Outside Directors with those of our shareholders, and (iii) provide appropriate compensation for the risks and responsibilities related to being an effective Outside Director. This compensation is recommended to the Board by the Nominating, Governance and Compensation Committee ("NGCC"). The NGCC is currently composed of three Outside Directors, each of whom is independent, namely Ms. Carolyn Egbert (Chair), Mr. Peter G. Edwards and Mr. Gilles Gagnon.

The Board has adopted a formal mandate for the NGCC, which is available on our website at www.zentaris.com. The mandate of the NGCC provides that it is responsible for, among other matters, assisting the Board in developing our approach to corporate governance issues, proposing new Board nominees, overseeing the assessment of the effectiveness of the Board and its committees, their respective chairs and individual directors, making recommendations to the Board with respect to directors' compensation and generally serving in a leadership role for our corporate governance practices.

Retainers

Our Outside Directors are paid an annual retainer, the amount of which depends on the position held on the Board. Annual retainers are paid on a quarterly basis to our Outside Directors. Each Outside Director is paid the equivalent value of the payment in his or her home currency, net of any withholdings or deductions required by applicable law.

Type of Compensation	Monthly Retainer for the year 2022	Annual Retainer for the year 2022
Chair of the Board Retainer	—	80,000
Board Member Retainer	—	50,000
Audit Committee Chair Retainer	—	30,000
Audit Committee Member Retainer	—	7,500
NGCC Chair Retainer	—	15,000
NGCC Member Retainer	—	5,000
Steering Committee Retainer	6,500	—

All Directors are reimbursed for travel and other out-of-pocket expenses incurred in attending Board or committee meetings. Retainers are prorated when an Outside Director joins the Board during a financial year.

Outstanding Awards

The following table shows all awards outstanding to each Outside Director as at December 31, 2022:

Name	Option-based Awards				Share-based Awards				
	Issuance Date (mm-dd-yyyy)	Number of Securities Underlying Unexercised Options (#)	Option Exercise Price (\$)	Option Expiration Date (mm-dd-yyyy)	Value of Unexercised In-the-money Options ⁽¹⁾ (\$)	Issuance Date (mm-dd-yyyy)	Number of Shares or Units of Shares that have Vested (#)	Market or Payout Value of Share-based Awards that have Not Vested ⁽²⁾ (\$)	Market or payout value of vested share-based awards not paid out or distributed ⁽²⁾ (\$)
Edwards, Peter	—	—	—	—	—	05/15/2020	1,200	—	3,816
	—	—	—	—	—	05/05/2021	2,800	—	8,904
	—	—	—	—	—	08/03/2022	20,000	—	63,600
	05-10-2016	400	87.00	05-09-2023	—	—	—	—	—
	12-06-2016	314	86.25	12-06-2023	—	—	—	—	—
	08-15-2017	2,400	51.25	08-15-2024	—	—	—	—	—
Egbert, Carolyn	—	—	—	—	—	05/08/2018	920	—	2,926
	—	—	—	—	—	05/22/2019	1,200	—	3,816
	—	—	—	—	—	05/15/2020	1,200	—	3,816
	—	—	—	—	—	05/15/2021	2,800	—	8,904
	—	—	—	—	—	08/03/2022	20,000	—	63,600
Gagnon, Gilles	—	—	—	—	—	05/15/2020	1,200	—	3,816
	—	—	—	—	—	05/19/2021	2,800	—	8,904
	—	—	—	—	—	08/03/2022	20,000	—	63,600
Turpin, Dennis	—	—	—	—	—	05/19/2021	2,800	—	8,904
	—	—	—	—	—	08/03/2022	20,000	—	63,600

(1) “Value of unexercised in-the-money options” at financial year-end is calculated based on the difference between the closing prices of the Common Shares on the NASDAQ on the last trading day of the fiscal year (December 31, 2022) of \$3.18 and the exercise price of the options, multiplied by the number of unexercised options.

(2) The Company used the closing price of its Common Shares on the NASDAQ as at the last trading day of the fiscal year (December 31, 2022) of \$3.18.

See “Summary of the Stock Option Plan” for more details on the Company’s second amended and restated stock option plan adopted by the Board on March 29, 2016 and ratified by the shareholders on May 10, 2016 (“**Stock Option Plan**”) and see “Summary of Long-Term Incentive Plan” for more details on the Company’s long-term incentive plan adopted by the Board on March 27, 2018, and ratified by the shareholders on May 8, 2018 (“**Long-Term Incentive Plan**”).

Total Compensation of Outside Directors

The table below summarizes the total compensation paid to our Outside Directors during the financial year ended December 31, 2022 (all amounts are in U.S. dollars). Our Outside Directors are generally paid in their home currency. Mr. Gagnon and Mr. Turpin were paid in Canadian dollars. Ms. Egbert and Mr. Edwards were paid in U.S. dollars.

Name	Fees earned ⁽¹⁾ (\$)	Share-based Awards ⁽²⁾ (\$)	Option-based Awards (\$)	Non-Equity Incentive Plan Compensation (\$)	Pension Value (\$)	All Other Compensation (\$)	Total (\$)
Edwards, Peter	69,750	100,400	—	—	—	—	170,150
Egbert, Carolyn	102,000	100,400	—	—	—	—	202,400
Gagnon, Gilles	55,615	100,400	—	—	—	—	156,015
Turpin, Dennis	76,517	100,400	—	—	—	—	176,917

- (1) In respect of our financial year ended December 31, 2022, we paid an aggregate amount of \$303,882 in fees to all of our Outside Directors for services rendered in their capacity as directors, excluding reimbursement of out-of-pocket expenses and the value of share-based and option-based awards granted in 2022.
- (2) Amounts shown represent the value of the DSUs on the grant date (\$5.02). The value of one DSU on the grant date is the closing price of one Common Share on the NASDAQ on the last trading day preceding the date of grant.

Compensation of Executive Officers

The following is disclosure of information related to the compensation that we paid to our “Named Executive Officers” during 2022. For the 2022 year, our “Named Executive Officers” were as follows:

- Dr. Klaus Paulini, who, since October 4, 2019, is serving as President and Chief Executive Officer, as well as Managing Director AEZS Germany since July 2019;
- Mr. Giuliano La Fratta, who, since January 24, 2022, is serving as Senior Vice President, Chief Financial Officer; and
- Dr. Matthias Gerlach, who serves as Vice President Manufacturing and Supply Chain; Mr. Eckhard Guenther, who serves as Vice President Business Development & Alliance Management and Managing Director AEZS Germany; Ms. Nicola Ammer, who serves as Chief Medical Officer and Senior Vice President Clinical Development; and Mr. Michael Teifel who serves as Senior Vice President, Non-Clinical Development and Chief Scientific Officer, who were our hour most highly compensated executive officers.

Compensation Discussion & Analysis

Compensation Philosophy and Objectives

Our Board, through the NGCC, establishes our executive compensation program that is market-based and at a competitive percentile grouping for both total cash and total direct compensation. The NGCC has established a compensation program that is designed to attract, motivate and retain high-performing senior executives, encourage and reward superior performance and align the executives’ interests with those of our shareholders by:

- providing the opportunity for an executive to earn compensation that is competitive with the compensation received by executives serving in the same or measurably similar positions within comparable companies;
- providing the opportunity for executives to participate in equity-based incentive compensation plans;
- aligning executive compensation with our corporate objectives; and
- attracting and retaining highly qualified individuals in key positions.

Compensation Elements

Our executive compensation is targeted at the 50th percentile for small cap biopharmaceutical companies within both the local and national markets and is comprised of both fixed and variable components. The variable components include equity and non-equity incentive plans. Each compensation component is intended to serve a different function, but all elements are intended to work in concert to maximize both corporate and individual performance by establishing specific, competitive operational and corporate goals and by providing financial incentives to employees based on their level of attainment of these goals.

Our current executive compensation program is comprised of the following four basic components: (i) base salary; (ii) an annual bonus linked to both individual and corporate performance; (iii) equity incentives, including stock options, previously granted under our second amended and restated stock option plan adopted by the Board on March 29, 2016 and ratified by the shareholders of Aeterna Zentaris on May 10, 2016 (the “**Stock Option Plan**”), and presently granted under the Corporation’s long-term incentive plan adopted by the Board on March 27, 2018 and ratified by the shareholders of Aeterna Zentaris on May 8, 2018 (the “**Long-Term Incentive Plan**”), established for the benefit of our directors, certain executive officers and other participants as may be designated from time to time by either the Board or the NGCC; and (iv) other elements of compensation, consisting of benefits, perquisites and retirement benefits.

Base Salary. Base salaries are intended to provide a steady income to our executive officers regardless of share price. In determining individual base salaries, the NGCC takes into consideration individual circumstances that may include the scope of an executive’s position, the executive’s relevant competencies or experience and retention risk. The NGCC also takes into consideration the fulfillment of our corporate objectives, as well as the individual performance of the executive.

Short-Term, Non-Equity Incentive Compensation. Our short-term, non-equity incentive compensation plan sets a target cash bonus for each executive officer, expressed as a percentage of the executive officer’s base salary. The amount of cash bonus paid to an executive officer depends on the extent to which he or she contributed to the achievement of the annual performance objectives established by the Board for the year. The annual performance objectives are specific operational, clinical, regulatory, financial, commercial and corporate goals that are intended to advance our product pipeline, to promote the success of our commercial efforts and to enhance our financial position. The annual performance objectives are set at the end of each financial year as part of the annual review of corporate strategies. The performance objectives are not established for individual executive officers but rather by functional area(s), many of which are carried out by or fall within the responsibility of our President and Chief Executive Officer, Chief Financial Officer (or principal financial officer) and our other executive officers, including our Named Executive Officers. The award of a cash bonus requires the approval of both the NGCC and the Board and is based upon an assessment of each individual’s performance, as well as our overall performance at a corporate level. The determination of individual performance does not involve quantitative measures using a mathematical calculation in which each individual performance objective is given a numerical weight. Instead, the NGCC’s determination of individual performance is a subjective determination as to whether a particular executive officer substantially achieved the stated objectives or over-performed or under-performed with respect to corporate objectives that were deemed to be important to our success.

Long-Term Equity Compensation Plan of Executive Officers. The long-term component of the compensation of our executive officers is based exclusively on the Long-Term Incentive Plan, which permits the issuance of a number of equity-based awards based on the contribution of the officers and their responsibilities. The Board adopted a policy regarding stock option grants in December 2014, which provides that each Named Executive Officer is eligible to receive options to acquire our Common Shares having a value, based on the Black-Scholes option pricing model, equal to a specified multiple of his or her salary. The specified multiple for the President and Chief Executive Officer is 1.5. The specified multiple for each other Named Executive Officer is 0.75. To encourage retention and focus management on developing and successfully implementing our continuing growth strategy, stock options vest over a period of three years, with the first third vesting on the first anniversary of the date of grant. Since the adoption of the Long-Term Incentive Plan in 2018, we have broadened the types of equity-based awards which we may issue beyond stock options (to include, among other types, restricted stock units (“RSUs”), DSUs and others).

Other Forms of Compensation. Our executive employee benefits program also includes life, medical, dental and disability insurance to the same extent and in the same manner as all other employees as either enrollment in the payroll system benefits program or by additional percentage compensation to self-enroll in private insurance policies. These benefits and perquisites are designed to be competitive overall with equivalent positions in comparable North American organizations in the life sciences industry. We also contribute to our North American employees’ retirement plans up to an annual maximum amount of \$19,500 for employees in the United States and Canada. The contribution amounts for our United States and Canadian employees are subject to limitations imposed by the United States Internal Revenue Service and the Canadian Revenue Agency respectively, on contributions to our most highly compensated employees. Employees based in Frankfurt, Germany also benefit from certain employer contributions into the employees’ pension funds. Our executive officers, including the Named Executive Officers, are eligible to participate in such employer-contribution plans to the same extent and in the same manner as all other employees.

Positioning

The NGCC is authorized to engage its own independent consultant to advise it with respect to executive compensation matters. While the NGCC may rely on external information and advice, all of the decisions with respect to executive compensation are made by the Board upon the recommendation of the NGCC and may reflect factors and considerations other than, or that may differ from, the information and recommendations provided by any external compensation consultants that may be retained from time to time.

In 2022, the NGCC retained a compensation consultant to benchmark our director compensation plan in an effort to determine whether we were achieving our objective of providing market competitive compensation opportunities. The compensation consultant gathered compensation data from companies that it concluded were of comparable size and/or stage of development as us and from other companies with which we compete. Based, in part, on the recommendations of the compensation consultant, the NGCC recommended, and the Board approved, certain changes to the board member retainer and committee chair compensation.

Risk Assessment of Executive Compensation Program

The Board, through the NGCC, oversees the implementation of compensation methods that tie a portion of executive compensation to our short-term and long-term performance and that of each executive officer and that take into account the advantages and risks associated with such compensation methods. In addition, the Board oversees the creation of compensation policies that are intended to reward the creation of shareholder value while reflecting a balance between our short-term and long-term performance and that of each executive officer. The NGCC has considered in general terms the concept of risk as it relates to our executive compensation program.

Base salaries are fixed in amount to provide a steady income to the executive officers regardless of share price and thus do not encourage or reward risk-taking to the detriment of other important business, operational, commercial or clinical metrics or milestones. The variable compensation elements (annual bonuses and equity-based awards) are designed to reward each of short-term, mid-term and long-term performance. For short-term performance, a discretionary annual bonus may be awarded based on the timing and level of attainment of specific operational and corporate goals that the NGCC believes to be challenging yet does not encourage unnecessary or excessive risk-taking. While our bonus payments are generally based on annual performance, a maximum bonus payment is pre-fixed for each senior executive officer and represents only a portion of each individual’s overall total compensation opportunities. In exceptional circumstances, a particular executive officer may be awarded a bonus that exceeds his or her maximum pre-fixed or target bonus amount. Finally, a significant portion of executive compensation is provided in the form of equity-based awards, which is intended to further align the interests of executives with those of shareholders. The NGCC believes that these awards do not encourage unnecessary or excessive risk-taking since the ultimate value of the awards is tied to our share price, and in the case of grants under the long-term incentive compensation plan, are generally subject to mid-term and long-term vesting schedules to help ensure that executives generally have significant value tied to long-term share price performance.

The NGCC believes that the variable compensation elements (annual bonuses and equity-based awards) represent a percentage of overall compensation that is sufficient to motivate our executive officers to produce superior short-term, mid-term and long-term corporate results, while the fixed compensation element (base salary) is also sufficient to discourage executive officers from taking unnecessary or excessive risks. The NGCC and the Board also generally have the discretion to adjust annual bonuses and equity-based awards based on individual performance and any other factors they may determine to be appropriate in the circumstances. Such factors may include, where necessary or appropriate, the level of risk-taking a particular executive officer may have engaged in during the preceding year.

Based on the foregoing, the NGCC has not identified any specific risks associated with our executive compensation program that are reasonably likely to have a material adverse effect on us. The NGCC believes that our executive compensation program does not encourage or reward any unnecessary or excessive risk-taking behavior.

Our directors, executive officers and employees are prohibited from purchasing, selling or otherwise trading in derivative securities relating to our Common Shares. Derivative securities are securities whose value varies in relation to the price of our securities. Examples of derivative securities include warrants to purchase our Common Shares, and put or call options written on our Common

Shares, as well as individually arranged derivative transactions, such as financial instruments, including, for greater certainty, prepaid variable forward contracts, equity swaps, collars, or units of exchange funds, which are designed to hedge or offset a decrease in market value of our equity securities granted as executive compensation or directors' remuneration. Options to acquire our Common Shares and other equity-based awards issued pursuant to the Stock Option Plan or Long-Term Incentive Plan are not derivative securities for this purpose.

2022 Compensation

Base Salary. The primary element of our compensation program is base salary. Our view is that a competitive base salary is a necessary element for retaining qualified executive officers. In determining individual base salaries, the NGCC takes into consideration individual circumstances that may include the scope of an executive's position, the executive's relevant competencies or experience and retention risk. The NGCC also takes into consideration the fulfillment of our corporate objectives, as well as the individual performance of the executive.

Short-Term, Non-Equity Incentive Compensation. The Board, based on the NGCC's recommendation, adopted the following performance objectives for 2022:

Goal	Result
Provide a corporate development analysis and a strategic plan with risk analysis and mitigation options prior to March BoD meeting.	Given the developments in H2 (NN's notice) in late August, finding new commercialization partners is a top priority.
Maintain a tool for planning and projecting expenses for development projects in relation to our cash runway.	Assessment of potential strategic options is ongoing. Development projects are pursued with prioritization and continuous monitoring and adjustment of expenses.
Support all activities for timely and efficient market entry of Macimorelin in new markets.	For macimorelin no clinical study is required in Korea and Israeli approval is achieved. Supply preparations are ongoing.
Develop a detailed IR plan, identify improvement options to ensure NASDAQ compliance requirements are met to avoid delisting	The overall shift in market sentiment (focus on risk), did not allow to gain the appropriate appreciation.
Conduct timely clinical study/studies with measurable milestones in 2022, ensuring track to approval of pediatric indication of macimorelin in 2023.	<p>This extremely challenging goal under given circumstances was not achieved mainly by outside factors like the persistent COVID-19 pandemic, the war in Ukraine and prudent management of overall spending.</p> <p>Mitigating activities could only be initiated in Q3-Q4 given the changes regarding Novo</p>
Reduce macimorelin API cost	Achieved. Critical for commercial option as therapeutic and overall profitability.
Ensure development programs are on track for at least one project to enter clinical development in H1 2023	<p>Worldwide supply and logistics situation deteriorated throughout 2022. We acted cautiously to preserve cash but also ensure progress as fast as possible.</p> <p>There remains a chance to get the ALS project to clinic by the end of 2023, given positive in-vivo efficacy data (decision point at end of Q1 2023).</p>
Ensure seamless transition to and integration of new CFO. Assess and potentially streamline or restructure finance organization to achieve a more efficient, cost effective function	New CFO did an excellent job in taking ownership of the finance operations and in re-organizing the department under demanding circumstances. Goal was achieved.

Long-Term Equity Compensation

For the financial year ended December 31, 2022, the Board approved awards of a total of 2,000 stock options at an exercise price of \$8.88 to one employee on January 10, 2022.

Summary of the Stock Option Plan

We established the Stock Option Plan in order to attract and retain directors, officers, employees and suppliers of ongoing services, who will be motivated to work towards ensuring our success. The Board has full and complete authority to interpret the Stock Option Plan, to establish applicable rules and regulations and to make all other determinations it deems necessary or useful for the administration of the Stock Option Plan, provided that such interpretations, rules, regulations and determinations are consistent with the rules of all stock exchanges and quotation systems on which our securities are then traded and with all relevant securities legislation.

There were 5,030 options outstanding under the Stock Option Plan representing approximately 0.1% of all issued and outstanding Common Shares as of December 31, 2022. The proposed number of Common Shares issuable pursuant to the Long-Term Incentive Plan is fixed at 11.4% of the issued and outstanding Common Shares at any given time less the number of Common Shares issuable pursuant to stock options granted at such time under the Stock Option Plan. See below for a complete description of the Long-Term Incentive Plan. As of December 31, 2021, there were 493,195 Common Shares unallocated and available for future grants of options under the Stock Option Plan; however, the Corporation does not intend on issuing any new stock options under the Stock Option Plan, and instead will issue any future stock options under the Long-Term Incentive Plan.

The burn rate for the Stock Option Plan for the most recently completed fiscal year is set out below:

Stock Option Plan			
Year End	Options Granted	Weighted Average Shares Outstanding	Burn Rate⁽¹⁾
December 31, 2022	—	4,855,766	0%
December 31, 2021	—	4,596,980	0%
December 31, 2020	—	1,643,327	0%

(1) Annual burn rate is expressed as a percentage and is calculated by dividing the number of securities granted under the Stock Option Plan by the weighted average number of securities outstanding for the applicable fiscal year

Under the Stock Option Plan, (i) the number of securities issuable to insiders, at any time, or issued within any one-year period, under all of our security-based compensation arrangements, cannot exceed 10% of our issued and outstanding securities and (ii) no single person eligible to receive grants under the Stock Option Plan (each a “Participant”) may hold options to purchase, from time to time, more than 5% of our issued and outstanding Common Shares. In addition: (i) the aggregate fair value of options granted under all of our security-based compensation arrangements to any one of our Outside Directors entitled to receive a benefit under the Stock Option Plan, within any one-year period, cannot exceed \$100,000 valued on a Black-Scholes basis and as determined by the NGCC; and (ii) the aggregate number of securities issuable to all of our Outside Directors entitled to receive a benefit under the Stock Option Plan, within any one-year period, under all of our security-based compensation arrangements, cannot exceed 1% of its issued and outstanding securities.

Options granted under the Stock Option Plan may be exercised at any time within a maximum period of seven or ten years following the date of their grant (the “**Outside Expiry Date**”), depending on the date of grant. The Board or the NGCC, as the case may be, designates, at its discretion, the specific Participants to whom stock options are granted under the Stock Option Plan and determines the number of Common Shares covered by each of such option grants, the grant date, the exercise price of each option, the Outside Expiry Date and any other matter relating thereto, in each case in accordance with the applicable rules and regulations of the regulatory authorities. The price at which the Common Shares may be purchased may not be lower than the greater of the closing prices of the Common Shares on the NASDAQ on the last trading day preceding the date of grant of the option. Options granted under the Stock Option Plan shall vest in equal tranches over a three-year period (one-third each year, starting on the first anniversary of the grant date) or as otherwise determined by the Board or the NGCC, as the case may be. Participants may not assign their options (nor any interest therein) other than by will or in accordance with the applicable laws of estates and succession.

Unless the Board or the NGCC decides otherwise, Participants cease to be entitled to exercise their options under the Stock Option Plan: (i) immediately, in the event a Participant who is an officer or employee resigns or voluntarily leaves his or her employment or his or her employment is terminated with cause and, in the case of a Participant who is a non-employee director of us or one of our subsidiaries, the date on which such Participant ceases to be a member of the relevant Board; (ii) six months following the date on which employment is terminated as a result of the death of a Participant who is an officer or employee and, in the case of a Participant who is an Outside Director, six months following the date on which such Participant ceases to be a member of the Board by reason of death; (iii) 90 days following the date on which a Participant’s employment is terminated for a reason other than those mentioned in (i) or (ii) above including, without limitation, upon the disability, long-term illness, retirement or early retirement of the Participant; and (iv) where the Participant is a service supplier, 30 days following the date on which such Participant ceases to act as such, for any cause or reason (each, an “**Early Expiry Date**”).

The Stock Option Plan also provides that, if the expiry date of one or more options (whether an Early Expiry Date or an Outside Expiry Date) occurs during a “blackout period” or within the seven business days immediately after a blackout period imposed by us, the expiry date will be automatically extended to the date that is seven business days after the last day of the blackout period. For the purposes of the foregoing, “blackout period” means the period during which trading in our securities is restricted in accordance with our corporate policies.

If (i) we accept an offer to amalgamate, merge or consolidate with any other entity (other than one of our wholly-owned subsidiaries) or to sell or license all or substantially all of our assets to any other entity (other than one of our wholly-owned subsidiaries); (ii) we sign a support agreement in customary form pursuant to which the Board agrees to support a takeover bid and recommends that our shareholders tender their Common Shares to such takeover bid; or (iii) holders of more than 50% of our then outstanding Common Shares tender all of their Common Shares to a takeover bid made to all of the holders of the Common Shares to purchase all of the then issued and outstanding Common Shares, then, in each case, all of the outstanding options shall, without any further action required to be taken by us, immediately vest. Each Participant shall thereafter be entitled to exercise all of such options at any time up to and including, but not after the close of business on that date which is ten days following the Closing Date (as defined below). Upon the expiration of such ten-day period, all rights of the Participant to such options or to the exercise of same (to the extent not already exercised) shall automatically terminate and have no further force or effect whatsoever. “Closing Date” is defined to mean (x) the closing date of the amalgamation, merger, consolidation, sale or license transaction in the case of clause (i) above; (y) the first expiry date of the takeover bid on which each of the offeror’s conditions are either satisfied or waived in the case of clause (ii) above; or (z) the date on which it is publicly announced that holders of greater than 50% of our then outstanding Common Shares have tendered their Common Shares to a takeover bid in the case of clause (iii) above.

The Stock Option Plan provides that the following amendments may be made to the plan only upon approval of each of the Board and our shareholders as well as receipt of all required regulatory approvals:

- any amendment to Section 3.2 of the Stock Option Plan (which sets forth the limit on the number of options that may be granted to insiders) that would have the effect of permitting, without having to obtain shareholder approval on a “disinterested vote” at a duly convened shareholders’ meeting, the grant of any option(s) under the Stock Option Plan otherwise prohibited by Section 3.2;
- any amendment to the number of securities issuable under the Stock Option Plan (except for certain permitted adjustments, such as in the case of stock splits, consolidations or reclassifications);
- any amendment that would permit any option granted under the Stock Option Plan to be transferable or assignable other than by will or in accordance with the applicable laws of estates and succession;
- the addition of a cashless exercise feature, payable in cash or securities, which does not provide for a full deduction of the number of underlying securities from the Stock Option Plan reserve;
- the addition of a deferred or restricted share unit component or any other provision that results in employees receiving securities while no cash consideration is received by us;
- with respect to any Participant, whether or not such Participant is an “insider” and except in respect of certain permitted adjustments, such as in the case of stock splits, consolidations or reclassifications:
- any reduction in the exercise price of any option after the option has been granted; or
- any cancellation of an option and the re-grant of that option under different terms;
- any extension to the term of an option beyond its Outside Expiry Date to a Participant who is an “insider” (except for extensions made in the context of a “blackout period”);
- any amendment to the method of determining the exercise price of an option granted pursuant to the Stock Option Plan;
- the addition of any form of financial assistance or any amendment to a financial assistance provision which is more favorable to employees; and
- any amendment to the foregoing amending provisions requiring Board, shareholder and regulatory approvals.

The Stock Option Plan further provides that the following amendments may be made to the Stock Option Plan upon approval of the Board and upon receipt of all required regulatory approvals, but without shareholder approval:

- amendments of a “housekeeping” or clerical nature or to clarify the provisions of the Stock Option Plan;
- amendments regarding any vesting period of an option;
- amendments regarding the extension of an option beyond an Early Expiry Date in respect of any Participant, or the extension of an option beyond the Outside Expiry Date in respect of any Participant who is a “non-insider”;
- adjustments to the number of issuable Common Shares underlying, or the exercise price of, outstanding options resulting from a split or a consolidation of the Common Shares, a reclassification, the payment of a stock dividend, the payment of a special cash or non-cash distribution to our shareholders on a pro rata basis provided such distribution is approved by our shareholders in accordance with applicable law, a recapitalization, a reorganization or any other event which necessitates an equitable adjustment to the outstanding options in proportion with corresponding adjustments made to all outstanding Common Shares;
- discontinuing or terminating the Stock Option Plan; and any other amendment which does not require shareholder approval under the terms of the Stock Option Plan.

Summary of the Long-Term Incentive Plan

The purpose of the Long-Term Incentive Plan is to (i) promote our long-term financial interests and growth by attracting and retaining management and other personnel and key service providers with the training, experience and ability to enable them to make a substantial contribution to the success of our business; (ii) motivate management personnel by means of growth-related incentives to achieve long-range goals; and (iii) further the alignment of interests of participants with those of our shareholders through opportunities for increased share ownership in the Corporation.

The NGCC is the administrator of the Long-Term Incentive Plan (the “**Administrator**”). At any time, the Board may serve as the Administrator of the Long-Term Incentive Plan, in lieu of, or in addition, to the NGCC. Except as provided otherwise under the Long-Term Incentive Plan, the Administrator has plenary authority to grant awards pursuant to the terms of the Long-Term Incentive Plan to eligible individuals, determine the types of awards and the number of shares to be covered by the awards, establish the terms and conditions for awards, including the exercise price and term of awards, and take all other actions necessary or desirable to carry out the purpose and intent of the Long-Term Incentive Plan.

Participation in the Long-Term Incentive Plan is generally open to all officers, employees and other individuals, including Outside Directors. However, any individual whose services to the Corporation or any of its subsidiaries are limited to capital-raising transactions, or the promotion and maintenance of a market for the Corporation securities, are ineligible to participate in the Long-Term Incentive Plan. Prospective officers, employees and other service providers who have accepted offers to provide services to the Corporation may also participate in the Long-Term Incentive Plan.

The Long-Term Incentive Plan enables the grant of stock options, stock appreciation rights (“**SARs**”), stock awards, stock unit awards, performance shares, cash-based performance units, deferred share units and other stock-based awards, each of which may be granted separately or in tandem with other awards.

The maximum number of Common Shares issuable under the Long-Term Incentive Plan is fixed at 11.4% of the issued and outstanding Common Shares at any given time, less the number of Common Shares issuable pursuant to stock options granted at such time under the Stock Option Plan. There were 133,920 awards outstanding under the Long-Term Incentive Plan representing approximately 2.8% of all issued and outstanding Common Shares as of December 31, 2022. As of December 31, 2022, there were 414,620 Common Shares unallocated and available for future grants of awards that are settled in Common Shares under the Long-

Term Incentive Plan. See above for a complete description of the Stock Option Plan.

The burn rate for the LTIP for the most recently completed fiscal year is set out below:

LTIP			
Year End	Awards Granted	Weighted Average Shares Outstanding	Burn Rate ⁽¹⁾
December 31, 2022	82,000	4,855,876	1.7%
December 31, 2021	34,400	4,596,980	0.7%
December 31, 2020	12,000	1,643,327	0.7%

(1) Annual burn rate is expressed as a percentage and is calculated by dividing the number of securities granted under the LTIP by the weighted average number of securities outstanding for the applicable fiscal year.

The number of securities issuable to insiders, at any time, or issued within any one-year period, under all of our security-based compensation arrangements, cannot exceed 10% of our issued and outstanding securities and no single participant may hold options to purchase, from time to time, more than 5% of our issued and outstanding Common Shares.

The aggregate fair value of options granted under all of our security-based compensation arrangements to any one of our Outside Directors entitled to receive a benefit under the Long-Term Incentive Plan, within any one-year period, cannot exceed \$100,000 valued on a Black-Scholes basis and as determined by the NGCC; and the aggregate number of securities issuable to all of our Outside Directors entitled to receive a benefit under the Long-Term Incentive Plan, within any one-year period, under all of our security-based compensation arrangements, cannot exceed 1% of its issued and outstanding securities.

Except as provided below or within an award agreement, each award granted under the Long-Term Incentive Plan (other than a performance unit that cannot be paid in shares) will be subject to a minimum vesting period or minimum restriction period as follows: (i) each stock option or SAR will be subject to a minimum vesting period of 12 months from the date of grant, (ii) each award of stock, stock units, performance shares, performance units payable in shares and other stock-based awards ("**Full Value Awards**") granted to non-employee directors will be subject to a minimum restriction period of 12 months from the date of grant, and (iii) each Full Value Award granted to a participant other than a non-employee director will be subject to a minimum restriction period of 12 months from the date of grant if vesting of or lapse of restrictions on such award is based on the satisfaction of performance goals and a minimum restriction period of 36 months from the date of grant, applied in either pro rata installments or a single installment, if vesting of or lapse of restrictions on such award is based solely on the participant's satisfaction of specified service requirements with us (provided that no such Full Value Awards will vest or have its restrictions lapse during the first 12 months following the date of grant). If the grant of a performance award is conditioned on satisfaction of performance goals, the performance period must not be less than 12 months' duration, but no additional minimum restriction period need apply to such award. The minimum vesting period or minimum restriction period will not apply in the case of death or disability of a participant or in the event of a change in control. Awards that result in the issuance of an aggregate of up to 5% of the share pool under the Long-Term Incentive Plan may be granted without regard to such minimum vesting period or minimum restriction period.

A SAR is the right to receive a payment equal to the excess of the Fair Market Value (as defined below) of a specified number of shares on the date the SAR is exercised over the base price per share specified in the award agreement. The base price for each SAR cannot be less than 100% of the Fair Market Value of Common Shares on the grant date and the term of a SAR cannot be more than 10 years from the grant date, unless required otherwise by applicable law. At the discretion of the Administrator, the payment upon a SAR exercise may be in cash, shares or a combination of the two. The "Fair Market Value" means the official closing price per Common Share for the regular market session on the day of determination.

Awards granted under the Long-Term Incentive Plan shall not be subject in any manner to alienation, anticipation, sale, transfer, assignment, pledge, or encumbrance, except as otherwise determined by the Administrator; provided, however, that this restriction shall not apply to the Common Shares received in connection with an award after the date that the restrictions on transferability of such shares set forth in the applicable award agreement have lapsed.

Except as provided in the applicable award agreement or otherwise determined by the Administrator, and subject to the minimum vesting period or minimum restriction period described above, upon termination of service (as defined in the Long-Term Incentive Plan):

- Stock options or stock appreciation rights shall be forfeited, to the extent stock options or stock appreciation rights are not vested and exercisable;
- During the applicable restriction period, restricted stock and any accrued but unpaid dividends that are at that time subject to restrictions shall be forfeited; and
- During the applicable deferral period or portion thereof to which forfeiture conditions apply, or upon failure to satisfy any other conditions precedent to the delivery of Common Shares or cash to which RSUs, performance shares or performance units relate, all performance shares, performance units and RSUs and any other accrued but unpaid dividend equivalents with respect to such RSUs that are then subject to deferral or restriction shall be forfeited.

In the event of a change in control (as defined in the Long-Term Incentive Plan) of the Corporation, outstanding awards will terminate upon the effective time of the change in control unless provision is made for the continuation, assumption or substitution of awards by the surviving or successor entity or its parent. Unless an award agreement says otherwise, the following will occur with respect to awards that terminate in connection with a change in control of the Corporation:

- stock options and SARs, whether vested or unvested, will become fully exercisable and holders of these awards will be permitted immediately before the change in control to exercise them;
- restricted stock and RSUs with time-based vesting (i.e., not subject to achievement of performance goals) will become fully vested immediately before the change in control, and RSUs will be settled as promptly as is practicable in accordance with applicable law; and
- restricted stock, RSUs, performance shares, and performance units that vest based on the achievement of performance goals will become fully vested and earned based on the target performance level as to the performance goals, such that 100% of the target award is earned as of the date of the change of control; and the RSUs and performance units will be settled as promptly as is practicable in accordance with applicable law. The Long-Term Incentive Plan will terminate on the earlier of (i) the earliest date as of which all awards granted under the Long-Term Incentive Plan have been satisfied in full or terminated and no shares approved for issuance under the Long-Term Incentive Plan remain available to be granted under new awards, or (ii) the tenth anniversary of date the Long-Term Incentive Plan, as amended and restated, is approved by our shareholders.

The Administrator may amend, alter or discontinue the Long-Term Incentive Plan, but no amendment, alteration or discontinuation will be made that would materially impair the rights of a participant with respect to a previously granted award without his or her consent, except such an amendment made to comply with applicable law or rule of any securities exchange or market on which our Common Shares are listed or admitted for trading or to prevent adverse tax or accounting consequences to the Corporation or the participant. In no event, however, will an amendment be made without the approval of our shareholders to the extent such amendment would (i) materially increase the benefits accruing to participants under the Long-Term Incentive Plan, (ii) increase the number of shares that may be issued under the Long-Term Incentive Plan or to a participant, (iii) materially expand the eligibility for participation in the Long-Term Incentive Plan, (iv) eliminate or modify the prohibition on repricing of stock options and SARs, (v) lengthen the maximum term or lower the minimum exercise price or base price permitted for stock options and SARs, (vi) modify the prohibition on the issuance of reload or replenishment options, (vii) amend the amendment provisions in the Long-Term Incentive Plan, or (viii) amend the Long-Term Incentive Plan to remove or exceed the 10% insider participation limit.

Outstanding Option-Based Awards and Share-Based Awards

The following table shows all awards outstanding to our Named Executive Officers as of December 31, 2022:

Name	Option-based Awards					Share-based Awards			
	Issuance Date (mm/dd/yyyy)	Number of Securities Underlying Unexercised Options ⁽¹⁾ (#)	Option Exercise Price (\$)	Option Expiration Date (mm/dd/yyyy)	Value of Unexercised In-the-money Options ⁽²⁾ (\$)	Issuance Date	Market or Payout Value of Share-based Awards that have Not Vested (#)	Market or Payout Value of Share-based Awards that have Not Vested (\$)	Market or Payout Value of Share-based Awards that have Not Vested (#)
Paulini, Klaus	12/06/2016	100	86.25	12/06/2023	—	—	—	—	—
	08/15/2019	1,000	53.75	08/15/2026	—	—	—	—	—
	11/11/2019	1,400	25.75	11/11/2026	—	—	—	—	—
	12/14/2020	1,400	9.15	12/14/2027	—	—	—	—	—
	12/17/2021	4,000	10.51	12/17/2028	—	—	—	—	—
Giuliano La Fratta, Gerlach, Matthias	1/10/2022	2,000	8.88	01/10/2029	—	—	—	—	—
	12/06/2016	600	86.25	12/06/2023	—	—	—	—	—
	12/04/2019	800	21.75	12/04/2026	—	—	—	—	—
	12/14/2020	1,000	9.15	12/14/2027	—	—	—	—	—
	12/17/2021	2,000	10.51	12/17/2028	—	—	—	—	—
Guenther, Eckhard	11/08/2016	16	87.50	11/08/2023	—	—	—	—	—
	12/06/2016	400	86.25	12/06/2023	—	—	—	—	—
	12/04/2019	1,000	21.75	12/04/2026	—	—	—	—	—
	12/14/2020	1,000	9.15	12/14/2027	—	—	—	—	—
	12/17/2021	2,000	10.51	12/17/2028	—	—	—	—	—
Ammer, Nicola	12/06/2016	400	86.25	12/06/2023	—	—	—	—	—
	12/04/2019	1,000	21.75	12/04/2026	—	—	—	—	—
	12/14/2020	1,000	9.15	12/14/2027	—	—	—	—	—
	12/17/2021	2,000	10.51	12/17/2028	—	—	—	—	—
Teifel, Michael	12/17/2021	2,000	10.51	12/17/2028	—	—	—	—	—

(1) The number of securities underlying unexercised options represents all awards outstanding at December 31, 2022.

- (2) "Value of unexercised in-the-money options" at financial year-end is calculated based on the difference between the closing price of the Common Shares on the NASDAQ on the last trading day of the fiscal year (December 31, 2022) of \$3.18 and the exercise price of the options, multiplied by the number of unexercised options.

There were no share-based awards outstanding to our Named Executive Officers at December 31, 2022.

Incentive Plan Awards - Value Vested or Earned During the Year

The following table shows the incentive plan awards value vested or earned for each Named Executive Officer for the financial year ended December 31, 2022:

	Option-based awards — Value vested during the year ⁽¹⁾	Share-based awards — Value vested during the year	Non-equity incentive plan compensation — Value earned during the year ⁽²⁾
	\$	\$	\$
Paulini, Klaus	—	—	45,561
La Fratta, Giuliano	—	—	31,192
Gerlach, Matthias	—	—	24,370
Guenther, Eckhard	—	—	19,072
Ammer, Nicola	—	—	23,310
Teifel, Michael	—	—	23,310

- (1) Represents the aggregate dollar value that would have been realized if the options had been exercised on the vesting date, based on the difference between the closing price of the Common Shares on the NASDAQ and the exercise price on such vesting date. If closing price of the Common Shares on the NASDAQ on the vesting date was lower than the exercise price, then \$nil was considered realized.

- (2) During 2022, each of Dr. Paulini, Dr. Gerlach, Dr. Guenther and Dr. Ammer were paid bonuses granted in 2022 for activities related to 2021 and will be paid in 2023 bonuses granted in 2023 for activities related to 2022.

Summary Compensation Table

The Summary Compensation Table set forth below shows compensation information for each of the Named Executive Officers for services rendered in all capacities during each of the financial years ended December 31, 2022, 2021 and 2020. All amounts in the table below are in U.S. dollars. Ms. Auld's and Mr. La Fratta's cash payments were made in Canadian dollars. All cash amounts paid to Dr. Paulini, Dr. Guenther, Dr. Gerlach, Dr. Teifel and Dr. Ammer were made in Euros.

SUMMARY COMPENSATION TABLE

Name and principal position	Years	Salary (\$)	Share based awards (\$)	Option based awards (\$)	Annual incentive plan (\$)	Long- term incentive plans (\$)	Pension Value (\$) ⁽²⁾	Contributions to Registered Retirement Saving Plan / 401K account (\$)	Total compensation (\$)
Paulini, Klaus ⁽³⁾ President and Chief Executive Officer; Managing Director AEZS	2022	319,614	—	—	45,561	—	218,798	—	583,972
	2021	374,496	—	35,298	162,530	—	213,700	—	786,024
	2020	306,086	—	9,503	183,580	—	292,983	—	792,152
Auld, Leslie Senior Vice President,	2022	17,116	—	—	—	—	—	—	17,116
	2021	163,038	—	—	—	—	—	—	163,038
Chief Financial Officer	2020	166,834	—	—	—	—	—	—	166,834
Giuliano La Fratta Senior Vice President, Chief Financial Officer	2022	208,262	—	14,944	31,192	—	—	12,921	267,319
Guenther, Eckhard Senior Vice President Business Development and Alliance	2022	223,359	—	—	19,072	—	(146,455)	—	95,976

Management; Managing Director AEZS Germany Gerlach, Matthias	2021	238,737	—	17,649	67,021	—	5,019	—	328,426
Senior Vice President Manufacturing and Supply Chain Ammer, Nicola	2020	218,966	—	6,788	85,460	—	97,937	—	409,151
Chief Medical Officer and Senior Vice President	2022	200,316	—	—	24,370	—	(247,820)	—	(23,135)
Clinical Development Teifel, Michael	2021	203,276	—	17,649	55,319	—	16,314	—	292,558
Chief Science Officer and Senior Vice President	2020	185,379	—	6,788	70,810	—	14,827	—	277,803
	2022	173,724	—	—	23,310	—	(29,047)	—	167,987
	2021	182,787	—	17,649	53,191	—	2,400	—	256,027
	2020	154,512	—	6,788	64,880	—	2,266	—	228,446
	2022	153,558	—	—	23,310	—	(139,729)	—	37,138
	2021	157,510	—	—	—	—	1,007	—	158,517

(1) Non-equity incentive plan compensation includes cash bonuses. During 2022, each of Dr. Paulini, Dr. Gerlach, Dr. Guenther and Dr. Ammer were paid for bonuses granted in 2021 for activities related to 2021 and will be paid in 2023 bonuses granted in 2022 for activities related to 2022.

(2) Dr. Paulini and Dr. Guenther participate in the DUPK (as defined below), a defined-contribution pension plan maintained by Unterstützungskasse Degussa e.V. that was introduced for employees who began their employment with AEZS Germany (or its predecessors) prior to December 31, 1999. The DUPK includes indirect obligations through a funded multi-employer contribution plan as well as direct unfunded defined benefit plans obligations. Dr. Gerlach participates in RUK 1 (as defined below), a defined-contribution pension plan maintained by Unterstützungskasse Degussa e.V. Dr. Ammer participates in RUK 2 (as defined below), a defined-contribution pension plan maintained by Unterstützungskasse Degussa e.V. The pension value represents the change in the pension liability between December 31, 2021 and 2022 for each Named Executive Officer. In 2022 there was a significant increase in the discount rate actuarial assumption from 1.1% in 2021 to 3.75% in 2022, that is used to estimate the Pension Benefit Plan obligation. For several of the named Executive Officers, this has resulted in a decline in the value of their Pension Value and is reflected in the above table

(3) Dr. Paulini did not receive any compensation in his role as a managing director of GmbH or as an executive director.

The value of option-based awards set out in the table above represents the closing price of the Common Shares on the NASDAQ on the last trading day preceding the date of grant multiplied by the Black-Scholes factor as at such date and the number of stock options granted on such date. For 2022, the Black-Scholes valuation model values the options based on the following assumptions: a 5.72-year expected life, 115.75% expected volatility, risk-free annual interest rate of 1.59% per annum and an expected dividend yield of 0%. See the consolidated financial statements for the Corporation for the years ended December 31, 2021, 2020 and 2019 and for the years ended December 31, 2020, 2019 and 2018 for the assumptions applied to the Black-Scholes option pricing model in previous years. The Corporation used the Black-Scholes valuation model as it most accurately captured the fair value of such options. The following table sets forth the value of the option-based awards and the corresponding Black-Scholes factor:

Date of Grant	Value of Grant	Black-Scholes Factor
November 9, 2016	\$ 87.50	80.35%
December 6, 2016	\$ 86.25	80.57%
December 16, 2016	\$ 95.00	80.68%
August 15, 2017	\$ 51.25	78.86%
April 2, 2018	\$ 36.50	77.57%
June 22, 2018	\$ 52.75	80.86%
August 15, 2019	\$ 53.75	79.22%
November 11, 2019	\$ 26.25	67.13%
December 4, 2019	\$ 21.75	68.01%
December 14, 2020	\$ 9.15	74.19%
December 17, 2021	\$ 10.50	83.94%
January 10, 2022	\$ 8.88	84.14%

Compensation of the Chief Executive Officer

The compensation of our President and Chief Executive Officer is governed by our executive compensation policy described in the section titled "Compensation of Executive Officers", and the President and Chief Executive Officer participates, together with the other Named Executive Officers, in all our incentive plans.

Dr. Paulini's total earnings during the financial year ended December 31, 2022 was \$583,972, including an incentive bonus in the amount of \$45,561.

For the financial year ended December 31, 2022, the Board did not approve an award of stock options to Dr. Paulini in accordance

with the Long-Term Incentive Plan.

See “Long-Term Equity Compensation Plan of Executive Officers - Summary of the Stock Option Plan”, for a complete description of the Stock Option Plan. See “Long-Term Equity Compensation Plan of Executive Officers - Summary of the Long-Term Incentive Plan”, for a complete description of the Long-Term Incentive Plan.

Pension, retirement or similar benefits

Each of our Named Executive Officers who are employed with AEZS Germany participate in defined-contribution pension plans. The terms of these pension plans are described below.

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Degussa Pensionskasse (“DUPK”)

Dr. Paulini and Dr. Guenther participate in the DUPK, a defined-contribution pension plan maintained by Unterstützungskasse Degussa e.V. that was introduced for employees who began their employment with AEZS Germany (or its predecessors) prior to December 31, 1999. The DUPK includes indirect obligations through a funded multi-employer contribution plan as well as direct unfunded defined benefit plans obligations.

Under the funded multi-employer contribution portion of the DUPK, the contributions by AEZS Germany and the employee are calculated based on the employee’s total salary during the prior year. The employee contributes 2% of his or her monthly average salary and AEZS Germany contributes an amount of 1.784 times the employee’s contribution. The contributions are limited to the social security contribution assessment ceiling. In 2022, the social security contribution assessment ceiling is \$7,666 (€7,275) per month. Accordingly, the employee will contribute at most \$153.32 (€145.50) monthly and AEZS Germany will contribute at most \$273.52 (€259.57) monthly.

Under the unfunded defined benefit portion of the DUPK, the employee earns additional claims for future pension payments for the part of the employee’s salary that exceeds the social security contribution assessment ceiling (“**Supplementary Pensions**”) that are unfunded and are presented as a pensions benefit obligation on the balance sheet of the Company. The Supplementary Pensions amount to 1.25% annually of a fictional salary peak, which is a percentage of the social security contribution assessment ceiling. Further, the employee is entitled to annual Christmas benefits (“**Christmas Benefits**”), which amount to 1.4% of the last pensionable monthly income for each year of service, limited by the social security contribution assessment ceiling. The employee’s contribution and AEZS Germany’s contribution are transferred monthly to the pension fund, and AEZS Germany’s contribution is calculated with the salary payments and treated as provision for pension payment. We are liable to the employees for the pension benefits that have been promised if the private pension provider does not, or cannot, pay the promised pension payments. Employees will receive a pension payment based on the contributions that were made during their employment, and will also receive the Supplementary Pensions and Christmas Benefits, after they have reached the statutory retirement age, independent of whether they work with AEZS Germany until such age. All direct pension obligations as well as pension obligations from deferred compensation are included and have been included in the pensions benefit obligation of the Company.

Rückgedeckte Unterstützungskasse 1 (“RUK 1”)

Dr. Gerlach participates in RUK 1, a defined-contribution pension plan maintained by Unterstützungskasse Degussa e.V. Under RUK 1, AEZS Germany contributes 2.4% of Dr. Gerlach’s monthly gross salary and Dr. Gerlach contributes 2% of his monthly gross salary. The contributions are limited to the social security contribution assessment ceiling. However, AEZS Germany provides an additional contribution of 18% of his monthly gross salary for the part of his salary that exceeds the social security contribution assessment ceiling. In 2022, the social security contribution assessment ceiling is \$7,666 (€7,275) per month. Accordingly, AEZS Germany will contribute at most \$1,844.48 (€1750.41) (which includes the additional contribution of 18%) monthly and Dr. Gerlach will contribute at most \$153.32 (€145.50) monthly. Both contributions are calculated with the monthly salary accounting and transferred to the relief fund monthly. We are liable to Dr. Gerlach for the pension benefits that have been promised if the private pension provider does not, or cannot, pay the promised pension payments. Dr. Gerlach will receive a pension payment based on the contributions that were made during his employment after he has reached the statutory retirement age, independent of whether he works with AEZS Germany until such age.

Rückgedeckte Unterstützungskasse 2 (“RUK 2”)

Dr. Ammer participates in RUK 2, a defined-contribution pension plan maintained by Unterstützungskasse Degussa e.V. Under RUK 2, AEZS Germany contributes 2.4% of Dr. Ammer’s monthly gross salary and Dr. Ammer contributes 3% of her monthly gross salary. The contributions are limited to the social security contribution assessment ceiling. In 2022, the social security contribution assessment ceiling is \$7,666 (€7,275) per month. Accordingly, AEZS Germany will contribute at most \$183.98 (€174.60) monthly and Dr. Ammer will contribute at most \$229.98 (€218.25) monthly. Both contributions are calculated with the monthly salary accounting and transferred to the relief fund monthly. We are liable to Dr. Ammer for the pension benefits that have been promised if the private pension provider does not, or cannot, pay the promised pension payments. Dr. Ammer will receive a pension payment based on the contributions that were made during her employment after she has reached the statutory retirement age, independent of whether she works with AEZS Germany until such age.

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The table below includes the following information about each Named Executive Officer participating in the DUPK, the Company’s only benefit plan with a defined benefit component:

- years of credited service as at December 31, 2022;

- estimated annual benefit accrued, or earned, for service to December 31, 2022 and to the normal retirement age of 65; and
- a reconciliation of the accrued obligation from December 31, 2021 to December 31, 2022.

Name	Number of years credited service (#) ⁽¹⁾	Annual benefits payable (\$) ⁽²⁾		Opening present value of defined benefit obligation (\$) ⁽³⁾	Compensatory change (\$) ⁽⁴⁾	Non-compensatory change (\$) ⁽⁵⁾	Closing present value of defined benefit obligation (\$) ⁽³⁾
		At year end	At age 65				
Paulini, Klaus	25	72,863	90,349	1,275,359	218,798	(140,813)	1,353,345
Guenther, Eckhard	32	48,643	48,643	1,228,378	(146,455)	(135,625)	946,298
Gerlach, Matthias	22	12,236	25,378	467,544	(247,820)	(51,622)	168,102
Teifel, Michael	18	14,834	14,834	396,134	(141,864)	(43,737)	210,532
Ammer, Nicola	8	2,269	4,895	65,352	(29,047)	(7,216)	29,089

(1) The number of years of credited service as at December 31, 2022 corresponds to the actual years of service with AEZS Germany.

(2) For each Named Executive Officer, the amount of annual benefits payable at December 31, 2022 is the pension the Named Executive Officer would be entitled to starting at age 65 based on termination of employment at December 31, 2022. For each Named Executive Officer, the annual benefits payable at age 65 is the annual benefits payable at December 31, 2022 increased to reflect estimated credited service at age 65.

(3) The present value is the estimated value of the pension obligation to the date indicated using the actuarial assumptions and methods that are consistent with those used in determining pension liabilities as disclosed in the Company's consolidated financial statements. In the past, certain Pension Benefit Plans were accounted for as defined contribution plans as sufficient information was not available for the Company to account for its proportionate share of the defined benefit obligation, plan assets and cost associated with such Pension Benefit Plans. In 2021, additional information became available to the Company, which began to account for its proportionate share of the defined benefit obligation and plan assets. The opening present value of defined benefit obligation for each named Executive Officer was adjusted to reflect the revised accounting treatment.

(4) Compensatory change represents the change in the pension liability between December 31, 2021 and 2022 for each Named Executive Officer.

(5) The calculations of reported amounts use the same actuarial assumptions and methods that are used for calculating accrued benefit obligations and annual expenses, as disclosed in the Company's 2022 and 2021 consolidated financial statements in Note 15, and as prescribed by International Financial Reporting Standards. The methods and assumptions used to determine estimated amounts will not be identical to the methods and assumptions used by other issuers so, as a result, the figures may not be directly comparable across issuers. All amounts shown above are based on assumptions and represent contractual entitlements that may change over time.

C. Board practices

Our Articles provide that our Board shall be composed of a minimum of five (5) and a maximum of fifteen (15) directors. Directors are elected annually by our shareholders, but the directors may from time to time appoint one or more directors, provided that the total number of directors so appointed does not exceed one-third of the number of directors elected at the last annual meeting of shareholders. Each elected director will remain in office until termination of the next annual meeting of the shareholders or until his or her successor is duly elected or appointed, unless his or her post is vacated earlier. We do not have service agreements with our independent directors.

See Item 6A. for information about the period of service of each of our directors and senior corporate officers.

Standing Committees of the Board of Directors

Our Board has established an Audit Committee and a NGCC.

Audit Committee

The Audit Committee assists the Board in fulfilling its oversight responsibilities. The Audit Committee reviews the financial reporting process, the system of internal control, the audit process, and our process for monitoring compliance with laws and regulations and with our Code of Ethical Conduct. In performing its duties, the Audit Committee will maintain effective working relationships with the Board, management, and the external auditors. To effectively perform his or her role, each committee member will obtain an understanding of the detailed responsibilities of committee membership as well as our business, operations and risks.

The function of the Audit Committee is oversight and while it has the responsibilities and powers set forth in its charter (incorporated by reference to Exhibit 11.3 to this Annual Report on Form 20-F), it is neither the duty of the committee to plan or to conduct audits or to determine that our financial statements are complete, accurate and in accordance with generally accepted accounting principles, nor to maintain internal controls and procedures.

The current members of the Audit Committee are Dennis Turpin (Chair), Peter G. Edwards, and Gilles Gagnon.

The compensation of executive officers of the Corporation and its subsidiaries is recommended to the Board by the NGCC. The NGCC is responsible for, among other matters, (i) assisting the Board in developing our approach to corporate governance issues, (ii) proposing new Board nominees, (iii) overseeing the assessment of the effectiveness of the Board and its committees, their respective chairs and individual directors and (iv) making recommendations to the Board with respect to board member nominees and directors' compensation, as well as serving in a leadership role for our corporate governance practices. It is also responsible for taking all reasonable actions to ensure that appropriate human resources policies, procedures and systems, e.g., recruitment and retention policies, competency and performance metrics and measurements, training and development programs, and market-based, competitive compensation and benefits structures, are in place so that we can attract, motivate and retain the quality of personnel required to achieve our business objectives. The NGCC also assists the Board in discharging its responsibilities relating to the recruitment, retention, development, assessment, compensation and succession planning for our executive and senior management members.

Thus, the NGCC recommends the appointment of senior officers, including the terms and conditions of their appointment and termination, and reviews the evaluation of the performance of our senior officers, including recommending their compensation and overseeing risk identification and management in relation to executive compensation policies and practices. The Board, which includes the members of the NGCC, reviews the Chief Executive Officer's corporate strategy, goals and performance objectives and evaluates and measures his or her performance and compensation against the achievement of such goals and objectives.

The NGCC recognizes that the industry, regulatory and competitive environment in which we operate requires a balanced level of risk-taking to promote and achieve the performance expectations of executives of a specialty biopharmaceutical company. The NGCC is of the view that our executive compensation program should not encourage senior executives to take inappropriate or unreasonable risk. In this regard, the NGCC recommends the implementation of compensation methods that appropriately connect a portion of senior executive compensation with our short-term and longer-term performance, as well as that of each individual executive officer and that take into account the advantages and risks associated with such compensation methods. The NGCC is also responsible for establishing compensation policies that are intended to reward the creation of shareholder value while reflecting a balance between our short-term and longer-term performance and that of each executive officer.

The NGCC is currently composed of Ms. Carolyn Egbert (Chair), Mr. Peter G. Edwards and Mr. Gilles Gagnon, each of whom is independent. The Board believes that the members of the NGCC collectively have the knowledge, experience and background required to fulfill its mandate:

D. Employees

As at December 31, 2022, we had a total of 21 active employees, of which 17 are based in Frankfurt, Germany. In addition, there was one employee based in the U.S. and 3 other active employees each based in Quebec, New Brunswick and Ontario, Canada.

Our current employees are engaged in the following activities: (i) six are engaged in research and development, regulatory affairs and quality assurance; (ii) six are involved in commercial operations and business development; and (iii) nine are involved in various administrative functions, including finance and accounting. We do not employ any sales representatives. As at December 31, 2021, we had a total of 17 active employees, of which 16 were based in Frankfurt, Germany. In addition, there was one employee based in the U.S. and our previous CFO was based in Toronto, Canada.

We have agreements with our employees covering confidentiality, loyalty, non-competition and assignment of all intellectual property rights developed during the employment period.

E. Share ownership

The table below sets forth information as of March 22, 2023 provided to us by our current directors and named executive officers concerning their ownership of Common Shares and stock options of the Company:

Name	No. of Common Shares owned or held	Percent⁽¹⁾	No. of stock options held⁽²⁾	No. of currently exercisable options
Ammer, Nicola	—	—	4,400	2,734
Egbert, Carolyn	1,276	*	3,114	3,114
Edwards, Peter G.	—	—	—	—
Gagnon, Gilles	—	—	—	—
Gerlach, Matthias	—	—	4,400	2,734
Guenther, Eckhard	—	—	4,416	2,750
Paulini, Klaus	4,200	*	7,900	4,768
Turpin, Dennis	4,821	*	—	—
Teifel, Michael	—	—	2,000	667
La Fratta, Giuliano	—	—	2,000	—
Total	10,297	—	28,230	16,767

* Less than 1%

(1) Based on 4,855,876 Common Shares outstanding as at March 22, 2023

- (2) For information regarding option expiration dates and exercise price refer to the tables included under the caption “Outstanding Option-Based Awards and Share-Based Awards”.

Item 7. Major Shareholders and Related Party Transactions

A. Major shareholders

We are not directly or indirectly owned or controlled by another corporation or by any foreign government. Based on filings with the SEC and the Canadian securities regulatory authorities, as at March 22, 2023, no individual or entity, other than as set out below, beneficially owned, directly or indirectly, or exercised control or direction over our Common Shares carrying more than 5% of the voting rights attached to all our Common Shares (to whom we refer as our major shareholders).

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Changes in Percentage Ownership by Major Shareholders

We had no major shareholders in 2017. During 2018, J. Goldman & Co., L.P. J., Goldman Capital Management, Inc., and Jay G. Goldman (collectively, “Goldman”) became major shareholders due to the acquisition of over 5% of our outstanding Common Shares, and as of December 31, 2019, Goldman ceased to be the beneficial owner of more than 5% of our Common Shares, based solely on a Schedule 13G filed with the SEC on February 14, 2020. On February 18, 2020, Armistice Capital Master Fund, LTD became a major shareholder of the Company due to the acquisition of over 5% of our outstanding Common Shares, but as of December 31, 2020 ceased to beneficially own more than 5% of our Common Shares, based solely on a Schedule 13G filed with the SEC on February 16, 2021. On July 1, 2020, Intracoastal Capital LLC became a major shareholder due to the acquisition of over 5% of our outstanding Common Shares, but as of December 31, 2021 ceased to beneficially own more than 5% of our Common Shares, based solely on a Schedule 13G filed with the SEC on February 11, 2022. On July 2, 2020, Lind Global Macro Fund, LP became a major shareholder due to the acquisition of over 5% of our outstanding Common Shares, but as of December 31, 2021 ceased to beneficially own more than 5% of our Common Shares, based solely on a Schedule 13G filed with the SEC on February 11, 2022. We have no major shareholders as of March 22, 2023.

United States Shareholders

Based on a review of the information provide to us by our transfer agent, as at March 22, 2023, there were 14 holders of record of our Common Shares, of which two were registered with an address in the U.S., holding in the aggregate approximately 99% of our outstanding Common Shares. We believe that the number of beneficial owners of our Common Shares is substantially greater than the number of record holders, because the overwhelming majority of our Common Shares are held in broker “street names”.

B. Related party transactions

Other than employment agreements and indemnification agreements with our management as described under “Item 10. – Additional Information,” there are no related party transactions.

C. Interests of experts and counsel

Not required.

Item 8. Financial Information

A. Consolidated statements and other financial information

The consolidated financial statements filed as part of this Annual Report on Form 20-F are presented under “Item 17. – Financial Statements”.

B. Significant changes

No significant changes occurred since the date of our annual consolidated financial statements included elsewhere in this Annual Report on Form 20-F.

Item 9. The Offer and Listing

A. Offer and listing details

Not applicable, except for Item 9A(4). Our Common Shares are listed on both the NASDAQ and the TSX under the symbol “AEZS”. The following table indicates, for the relevant periods, the high and low closing prices of our Common Shares on the NASDAQ and on the TSX as of December 31, 2022:

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	NASDAQ (US\$)		TSX (CAN\$)	
	High	Low	High	Low
2020	36.00	7.50	46.75	9.75
2021	83.50	9.00	106.25	16.00
2022	10.50	3.02	12.75	4.05
Fourth quarter	4.34	3.02	5.84	4.05

Third quarter	6.00	3.69	7.50	5.07
Second quarter	9.25	4.25	11.75	5.50
First quarter	10.50	8.25	12.75	10.25
2021	83.50	9.00	106.25	16.00
Fourth quarter	19.25	9.00	24.00	11.38
Third quarter	22.00	14.75	27.50	19.00
Second quarter	28.50	20.75	35.50	25.50
First quarter	83.50	12.75	106.25	16.00
2020	36.00	7.50	46.75	9.75
Fourth quarter	11.00	7.50	14.00	9.75
Third quarter	13.75	8.50	18.25	11.50
Second quarter	29.25	11.25	42.75	16.50
First quarter	36.00	10.50	46.75	14.75

B. Plan of distribution

Not applicable.

C. Markets

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

D. Selling shareholders

Not applicable.

E. Dilution

Not applicable.

F. Expenses of the issue

Not applicable.

Item 10. Additional Information

A. Share capital

Not required.

B. Memorandum and articles of association

We are governed by our restated articles of incorporation (the "**Restated Articles of Incorporation**") under the CBCA and by articles of amendment dated October 2, 2012, November 17, 2015, and May 9, 2019 (together with the Restated Articles of Incorporation, the "**Articles**") and by our bylaws, as amended and restated on March 21, 2013 (the "**bylaws**"). Our Articles are on file with Corporations Canada under Corporation Number 264271-9. The Articles do not include a stated purpose and do not place any restrictions on the business that we may carry on.

Inspection Rights of Shareholders

Under the CBCA, shareholders are entitled to be provided with a copy of the list of our registered shareholders. In order to obtain the shareholder list, a shareholder must provide to us an affidavit including, among other things, a statement that the list will only be used for the purposes permitted by the CBCA. These permitted purposes include an effort to influence the voting of our shareholders, an offer to acquire our securities and any other matter relating to our affairs. We are entitled to charge a reasonable fee for the provision of the shareholder list and must deliver that list no more than ten days after receipt of the affidavit described above.

Under the CBCA, shareholders have the right to inspect certain corporate records, including our Articles and bylaws and minutes of meetings and resolutions of the shareholders. Shareholders have no statutory right to inspect minutes of meetings and resolutions of our directors. Our shareholders have the right to certain financial information respecting us. In addition to the annual and quarterly financial statements required to be filed under applicable securities laws, we are required by the CBCA to place before every annual meeting of shareholders our audited comparative annual financial statements. In addition, shareholders have the right to examine the financial statements of each of our subsidiaries and any other corporate entity whose accounts are consolidated in our financial statements.

Directors

The minimum number of directors we must have is five (5) and the maximum number is fifteen (15). In accordance with the CBCA, at least 25% of our directors must be residents of Canada. In order to serve as a director, a person must be a natural person at least 18 years of age, of sound mind, not bankrupt, and must not be prohibited by any court from holding the office of director. None of the Articles, the bylaws and the CBCA impose any mandatory retirement requirements for directors.

The directors are elected by a majority of the votes cast at the annual meeting at which an election of directors is required, to hold office until the election of their successors, except in the case of resignations or if their offices become vacant by death or otherwise. Subject to the provisions of our bylaws, all directors may, if still qualified to serve as directors, stand for re-election. The Board is not replaced at staggered intervals but is elected annually.

There is no provision in our bylaws or Articles that requires that a director must be a shareholder.

The directors are entitled to remuneration as shall from time to time be determined by the Board or by a committee to which the Board may delegate the power to do so. Under the mandate of the NGCC, such committee, comprised of at least a majority of independent directors, is tasked with making recommendations to the Board concerning director remuneration. The directors are allowed to vote on and approve their own remuneration in the absence of an independent quorum of directors.

The CBCA provides that a director who is a party to, or who is a director or officer of, or has a material interest in, any person who is a party to a material contract or transaction or proposed material contract or transaction with us must disclose to us the nature and extent of his or her interest at the time and in the manner provided by the CBCA, or request that same be entered in the minutes of the meetings of the Board, even if such contract, in connection with our normal business activity, does not require the approval of either the directors or the shareholders. At the request of the president or any director, the director placed in a situation of conflict of interest must leave the meeting while the Board discusses the matter. The CBCA prohibits such a director from voting on any resolution to approve the contract or transaction unless the contract or transaction:

- relates primarily to his or her remuneration as our director, officer, employee or agent or as a director, officer, employee or agent of an affiliate of us;
- is for indemnity or insurance for director's liability as permitted by the CBCA; or
- is with our affiliate.

The CBCA provides that the Board may, on our behalf and without authorization of our shareholders:

- borrow money upon our credit;
- issue, reissue, sell or pledge our debt obligations;
- give a guarantee on our behalf to secure performance of an obligation of any person; and
- mortgage, hypothecate, pledge or otherwise create a security interest in all or any of our property, owned or subsequently acquired, to secure any of our obligations.

The shareholders have the ability to restrict such powers through our Articles or bylaws (or through a unanimous shareholder agreement), but no such restrictions are in place.

The CBCA prohibits the giving of a guarantee to any of our shareholders, directors, officers or employees or of an affiliated corporation or to an associate of any such person for any purpose or to any person for the purpose of or in connection with a purchase of a share issued or to be issued by us or our affiliates, where there are reasonable grounds for believing that we are or, after giving the guarantee, would be unable to pay our liabilities as they become due, or the realizable value of our assets in the form of assets pledged or encumbered to secure a guarantee, after giving the guarantee, would be less than the aggregate of our liabilities and stated capital of all classes. These borrowing powers may be varied by our bylaws or Articles. However, our bylaws and Articles do not contain any restrictions on or variations of these borrowing powers.

Pursuant to the CBCA, our directors manage and administer our business and affairs and exercise all such powers and authority as we are authorized to exercise pursuant to the CBCA, the Articles and the bylaws. The general duties of our directors and officers under the CBCA are to act honestly and in good faith with a view to our best interests and to exercise the care, diligence and skill that a reasonably prudent person would exercise in comparable circumstances. Any breach of these duties may lead to liability to us and our shareholders for breach of fiduciary duty. In addition, a breach of certain provisions of the CBCA, including the improper payment of dividends or the improper purchase or redemption of shares, will render the directors who authorized such action liable to account to us for any amounts improperly paid or distributed.

Our bylaws provide that the Board may, from time to time, appoint from amongst their number committees of the Board, and delegate to any such committee any of the powers of the Board except those which pursuant to the CBCA a committee of the Board has no authority to exercise. As such, the Board has two standing committees: the Audit Committee and the Nominating, Governance and Compensation Committee, or the NGCC.

Subject to the limitations provided by the CBCA, our bylaws provide that we shall, to the full extent provided by law, indemnify a director or an officer, a former director or officer or a person who acts or acted at our request as a director or officer of a body corporate of which we are or were a shareholder or creditor, and his or her heirs and legal representatives, against all costs, losses, charges and expenses, including an amount paid to settle an action or satisfy a judgment, reasonably incurred by him or her in respect of any civil, criminal or administrative action or proceeding to which he or she is made a party by reason of having been our director or officer or such body corporate, provided: (a) he or she acted in good faith in our best interests and (b) in the case of a criminal or an administrative action or proceeding that is enforced by a monetary penalty, he or she had reasonable grounds to believe that his or her conduct was lawful.

Our directors are authorized to indemnify from time to time any director or other person who has assumed or is about to assume in the normal course of business any liability for us or for any corporation controlled by us and to secure such director or other person against any loss by the pledge of all or part of our movable or immovable property through the creation of a hypothec or any other real right in all or part of such property or in any other manner.

We have also agreed to indemnify and save harmless our directors and senior corporate officers as well as the managing directors of our German subsidiary pursuant to various Director and Officer Indemnification Agreements against certain charges, damages,

awards, settlements, liabilities, interest, judgments, fines, penalties, statutory obligations, professional fees and retainers and other expenses of whatever nature or kind, provided that any such costs, charges, professional fees and other expenses are reasonable (collectively, “**Expenses**”) and from and against all Expenses sustained or incurred by the indemnified party as a result of serving as a director, officer or employee of the Company (or its subsidiary) in respect of any act, matter, deed or thing whatsoever made, done, committed, permitted, omitted or acquiesced in by the indemnified party as a director, officer or employee of the Company (or its subsidiary).

Share Capitalization

Our authorized share capital structure consists of an unlimited number of shares of the following classes (all classes are without nominal or par value): Common Shares; and first preferred shares (the “**First Preferred Shares**”) and second preferred shares (the “**Second Preferred Shares**” and, together with the First Preferred Shares, the “**Preferred Shares**”), both issuable in series. As at March 22, 2023, there were approximately 4,855,876 Common Shares outstanding. No Preferred Shares have been issued to date. We have also issued warrants to acquire Common Shares in connection with certain equity financings.

Common Shares

The holders of the Common Shares are entitled to one vote for each Common Share held by them at all meetings of shareholders, except meetings at which only shareholders of a specified class of shares are entitled to vote. In addition, the holders are entitled to receive dividends if, as and when declared by our Board on the Common Shares. Finally, the holders of the Common Shares are entitled to receive our remaining property upon any liquidation, dissolution or winding-up of our affairs, whether voluntary or involuntary. Shareholders have no liability to further capital calls as all shares issued and outstanding are fully paid and non-assessable.

Preferred Shares

The First and Second Preferred Shares are issuable in series with rights and privileges specific to each class. The holders of Preferred Shares are generally not entitled to receive notice of or to attend or vote at meetings of shareholders. The holders of First Preferred Shares are entitled to preference and priority to any participation of holders of Second Preferred Shares, Common Shares or shares of any other class of shares of our share capital ranking junior to the First Preferred Shares with respect to dividends and, in the event of our liquidation, the distribution of our property upon our dissolution or winding-up, or the distribution of all or part of our assets among the shareholders, to an amount equal to the value of the consideration paid in respect of such shares outstanding, as credited to our issued and paid-up share capital, on an equal basis, in proportion to the amount of their respective claims in regard to such shares held by them. The holders of Second Preferred Shares are entitled to preference and priority to any participation of holders of Common Shares or shares of any other class of shares of our share capital ranking junior to the Second Preferred Shares with respect to dividends and, in the event of our liquidation, the distribution of our property upon our dissolution or winding-up, or the distribution of all or part of our assets among the shareholders, to an amount equal to the value of the consideration paid in respect of such shares outstanding, as credited to our issued and paid-up share capital, on an equal basis, in proportion to the amount of their respective claims in regard to such shares held by them.

Our Board may, from time to time, provide for additional series of Preferred Shares to be created and issued, but the issuance of any Preferred Shares is subject to the general duties of the directors under the CBCA to act honestly and in good faith with a view to our best interests and to exercise the care, diligence and skill that a reasonably prudent person would exercise in comparable circumstances.

Warrants

For a description of our Warrants, see note 17 – share capital, warrants and other capital, to the audited consolidated financial statements included in Item 17 of this Annual Report on Form 20-F.

Shareholder Actions

The CBCA provides that our shareholders may, with leave of a court, bring an action in our name and on our behalf for the purpose of prosecuting, defending or discontinuing an action on our behalf. In order to grant leave to permit such an action, the CBCA provides that the court must be satisfied that our directors were given adequate notice of the application, the shareholder is acting in good faith and that it appears to be in our best interests that the action be brought.

Shareholder Rights Plan

The Board of the Company approved an amended and restated shareholder rights plan of the Company on March 29, 2019, which was approved, ratified and confirmed by the shareholders at the annual and special meeting of shareholders of the Company on May 8, 2019 (the “**Rights Plan**”). The Rights Plan amended and restated the Company’s shareholder rights plan originally implemented in 2016 and was implemented to ensure, to the extent possible, that all shareholders of the Company are treated fairly in connection with any take-over offer or other acquisition of control of the Company.

Objectives and Background of the Rights Plan

The fundamental objectives of the Rights Plan are to provide adequate time for our Board and shareholders to assess an unsolicited take-over bid for us, to provide the Board with sufficient time to explore and develop alternatives for maximizing shareholder value if

a take-over bid is made, and to provide shareholders with an equal opportunity to participate in a take-over bid.

The Rights Plan encourages a potential acquiror who makes a take-over bid to proceed either by way of a “Permitted Bid”, as described below, which requires a take-over bid to satisfy certain minimum standards designed to promote fairness, or with the concurrence of our Board. If a take-over bid fails to meet these minimum standards and the Rights Plan is not waived by the Board, the Rights Plan provides that holders of Common Shares, other than the acquiror, will be able to purchase additional Common Shares at a significant discount to market, thus exposing the person acquiring Common Shares to substantial dilution of its holdings.

Summary of the Rights Plan

The following is a summary of the principal terms of the Rights Plan, which summary is qualified in its entirety by reference to the terms thereof. Capitalized terms not otherwise defined in this summary shall have the meaning ascribed to such terms in the Rights Plan. A draft of the Rights Plan is available at the following websites: www.zenataris.com, www.sedar.com and www.sec.gov.

For the purposes of this summary and as set out in the Rights Plan, the term “NI 62-104” refers to National Instrument 62-104-*Take-Over Bids and Issuer Bids* adopted by the Canadian securities regulatory authorities, as now in effect or as the same may from time to time be amended, re-enacted or replaced and including for greater certainty any successor instrument thereto.

Operation of the Rights Plan

Pursuant to the terms of the Rights Plan, one right was issued in respect of each common share outstanding at 5:01 p.m. on March 29, 2016 (the “**Record Time**”). In addition, we will issue one right for each additional Common Share issued after the Record Time and prior to the earlier of the Separation Time (as defined below) and the Expiration Time (as defined below). The rights have an initial exercise price equal to the Market Price (as defined below) of the Common Shares as determined at the Separation Time, multiplied by five, subject to certain anti-dilution adjustments (the “**Exercise Price**”), and they are not exercisable until the Separation Time. Upon the occurrence of a Flip-in Event (as defined below), each right will entitle the holder thereof, other than an Acquiring Person or any other person whose rights are or become void pursuant to the provisions of the Rights Plan, to purchase from us, effective at the close of business on the eighth trading day after the Stock Acquisition Date (as defined below), upon payment to us of the Exercise Price, Common Shares having an aggregate Market Price equal to twice the Exercise Price on the date of consummation or occurrence of such Flip-in Event, subject to certain anti-dilution adjustments.

Definition of Market Price

Market Price is generally defined in the Rights Plan, on any given day on which a determination must be made, as the volume weighted average trading price of the Common Shares for the 20 consecutive trading days (i.e. days on which the TSX or another stock exchange or national securities quotation system on which the Common Shares are traded (including for greater certainty, each of the Nasdaq Global Select Market, the Nasdaq Global Market and the Nasdaq Capital Market) is open for the transaction of business, subject to certain exceptions), through and including the trading day immediately preceding such date of determination, subject to certain exceptions.

Trading of Rights

Until the Separation Time (or the earlier termination or expiration of the rights), the rights trade together with the Common Shares and are represented by the same share certificates as the Common Shares or an entry in our securities register in respect of any outstanding Common Shares. From and after the Separation Time and prior to the Expiration Time, the rights are evidenced by rights certificates and trade separately from the Common Shares. The rights do not carry any of the rights attaching to the Common Shares such as voting or dividend rights.

Separation Time

The rights will separate from the Common Shares to which they are attached and become exercisable at the time (the “**Separation Time**”) of the close of business on the eighth business day after the earliest to occur of:

- (1) the first date (the “Stock Acquisition Date”) of a public announcement of facts indicating that a person has become an Acquiring Person; and
- (2) the date of the commencement of, or first public announcement of the intention of any person (other than us or any of our subsidiaries) to commence a take-over bid or a share exchange bid for more than 20% of our outstanding Common Shares other than a Permitted Bid or a Competing Permitted Bid (as defined below), so long as such take-over bid continues to satisfy the requirements of a Permitted Bid or a Competing Permitted Bid, as the case may be.

The Separation Time can also be such later time as may from time to time be determined by the Board, provided that if any such take-over bid expires, or is canceled, terminated or otherwise withdrawn prior to the Separation Time, without securities deposited thereunder being taken up and paid for, it shall be deemed never to have been made and if the Board determines to waive the application of the Rights Plan to a particular Flip-in Event, the Separation Time in respect of such Flip-in Event shall be deemed never to have occurred.

From and after the Separation Time and prior to the Expiration Time, each right entitles the holder thereof to purchase one Common Share upon payment of the Exercise Price to us.

Flip-in Event

The acquisition by a person (an “**Acquiring Person**”), including others acting jointly or in concert with such person, of more than 20% of the outstanding Common Shares, other than by way of a Permitted Bid, a Competing Permitted Bid or in certain other limited

circumstances described in the Rights Plan, is referred to as a “Flip-in Event”.

In the event that, prior to the Expiration Time, a Flip-in Event that has not been waived occurs (see “Waiver and Redemption” below), each right (other than those held by or deemed to be held by the Acquiring Person) will thereafter entitle the holder thereof, effective as at the close of business on the eighth trading day after the Stock Acquisition Date, to purchase from us, upon payment of the Exercise Price and otherwise exercising such right in accordance with the terms of the Rights Plan, that number of Common Shares having an aggregate Market Price on the date of consummation or occurrence of the Flip-in Event equal to twice the Exercise Price, for an amount in cash equal to the Exercise Price (subject to certain anti-dilution adjustments described in the Rights Plan).

A bidder may enter into Permitted Lock-up Agreements with our shareholders (“**Locked-up Persons**”) who are not affiliates or associates of the bidder and who are not, other than by virtue of entering into such agreement, acting jointly or in concert with the bidder, whereby such shareholders agree to tender their Common Shares to the take-over bid (the “**Lock-up Bid**”) without the bidder being deemed to beneficially own the Common Shares deposited pursuant to the Lock-up Bid. Any such agreement must include a provision that permits the Locked-up Person to withdraw the Common Shares to tender to another take-over bid or to support another transaction that will either provide greater consideration to the shareholder than the Lock-up Bid or provide for a right to sell a greater number of shares than the Lock-up Bid contemplates (provided that the Permitted Lock-up Agreement may require that such greater number exceed the number of shares under the Locked-up Bid by a specified percentage not to exceed 7%).

A Permitted Lock-up Agreement may require that the consideration under the other transaction exceed the consideration under the Lock-up Bid by a specified amount. The specified amount may not be greater than 7%. For greater certainty, a Permitted Lock-up Agreement may contain a right of first refusal or require a period of delay (or other similar limitation) to give a bidder an opportunity to match a higher price in another transaction as long as the limitation does not preclude the exercise by the Locked-up Person of the right to withdraw the Common Shares during the period of the other take-over bid or transaction.

The Rights Plan requires that any Permitted Lock-up Agreement be made available to us and the public. The definition of Permitted Lock-up Agreement also provides that under a Permitted Lock-up Agreement, no “break up” fees, “topping” fees, penalties, expenses or other amounts that exceed in aggregate the greater of (i) 2.5% of the price or value of the aggregate consideration payable under the Lock-up Bid, and (ii) 50% of the amount by which the price or value of the consideration received by a Locked-up Person under another take-over bid or transaction exceeds what such Locked-up Person would have received under the Lock-up Bid, can be payable by such Locked-up Person if the Locked-up Person fails to deposit or tender Common Shares to the Lock-up Bid or withdraws Common Shares previously tendered thereto in order to deposit such Common Shares to another take-over bid or support another transaction.

Permitted Bid Requirements

The requirements of a Permitted Bid include the following:

1. the take-over bid must be made by means of a take-over bid circular;
2. the take-over bid must be made to all holders of Common Shares wherever resident, on identical terms and conditions, other than the bidder;
3. the take-over bid must not permit Common Shares tendered pursuant to the bid to be taken up or paid for:
 - a) prior to the close of business on a date that is not less than 105 days following the date of the relevant take-over bid or such shorter minimum period that a take-over bid (that is not exempt from any of the requirements of Division 5 (Bid Mechanics of NI 62-104)) must remain open for deposits of securities thereunder, in the applicable circumstances at such time, pursuant to NI 62-104;
 - b) then only if at the close of business on the date Common Shares (and/or “Convertible Securities”, as defined in the Rights Plan) are first taken up or paid for under such take-over bid, outstanding Common Shares and Convertible Securities held by shareholders other than any other Acquiring Person, the bidder, the bidder’s affiliates or associates, persons acting jointly or in concert with the bidder and any employee benefit plan, deferred profit-sharing plan, stock participation plan or trust for the benefit of our employees or the employees of any of our subsidiaries, unless the beneficiaries of such plan or trust direct the manner in which the Common Shares are to be voted or direct whether the Common Shares are to be tendered to a take-over bid (collectively, “Independent Shareholders”) that represent more than 50% of the aggregate of (I) then outstanding Common Shares and (II) Common Shares issuable upon the exercise of Convertible Securities, have been deposited or tendered pursuant to the take-over bid and not withdrawn
4. the take-over bid must allow Common Shares and/or Convertible Securities to be deposited or tendered pursuant to such take-over bid, unless such take-over bid is withdrawn, at any time prior to the close of business on the date Common Shares and/or Convertible Securities are first taken up or paid for under the take-over bid;
5. the take-over bid must allow Common Shares and/or Convertible Securities to be withdrawn until taken up and paid for; and
6. in the event the requirement set forth in clause 3.b) above is satisfied, the bidder must make a public announcement of that fact and the take-over bid must remain open for deposits and tenders of Common Shares for not less than ten days from the date of such public announcement.

A Permitted Bid need not be a bid for all outstanding Common Shares not held by the bidder, i.e., a Permitted Bid may be a partial bid. The Rights Plan also allows a competing Permitted Bid (a “**Competing Permitted Bid**”) to be made while a Permitted Bid is in existence. A Competing Permitted Bid must satisfy all the requirements of a Permitted Bid other than the requirement set out in clause 3.a) above and must not permit Common Shares tendered or deposited pursuant to the bid to be taken up or paid for prior to the close of business on the last day of the minimum initial deposit period that such take-over bid must remain open for deposits of securities thereunder pursuant to NI 62-104 after the date of the take-over bid constituting the Competing Permitted Bid; provided,

however, that a take-over bid that has qualified as a Competing Permitted Bid shall cease to be a Competing Permitted Bid at any time and as soon as such time as when such take-over bid ceases to meet any or all of the foregoing provisions of the definition of “Competing Permitted Bid” and any acquisition of Common Shares and/or Convertible Securities made pursuant to such take-over bid that qualified as a Competing Permitted Bid, including any acquisition of Common Shares and/or Convertible Securities made before such take-over bid ceased to be a Competing Permitted Bid, will not be a “Permitted Bid Acquisition” (as defined in the Rights Plan).

Waiver and Redemption

The Board may, prior to the occurrence of a Flip-in Event, waive the dilutive effects of the Rights Plan in respect of, among other things, a particular Flip-in Event resulting from a take-over bid made by way of a take-over bid circular to all holders of our Common Shares. In such an event, such waiver shall also be deemed to be a waiver in respect of any other Flip-in Event occurring under a take-over bid made by way of a take-over bid circular to all holders of Common Shares prior to the expiry of the first mentioned take-over bid.

The Board may, with the approval of a majority of Independent Shareholders (or, after the Separation Time has occurred, holders of rights, other than rights which are void pursuant to the provisions of the Rights Plan or which, prior to the Separation Time, are held otherwise than by Independent Shareholders), at any time prior to the occurrence of a Flip-in Event which has not been waived, elect to redeem all, but not less than all, of the then outstanding rights at a price of CAN\$0.00001 each, appropriately adjusted as provided in the Rights Plan (the “**Redemption Price**”). Where a take-over bid that is not a Permitted Bid or Competing Permitted Bid is withdrawn or otherwise terminated after the Separation Time has occurred and prior to the occurrence of a Flip-in Event, the Board may elect to redeem all the outstanding rights at the Redemption Price without the consent of the holders of the Common Shares or the rights and reissue rights under the Rights Plan to holders of record of Common Shares immediately following such redemption. Upon the rights being so redeemed and reissued, all the provisions of the Rights Plan will continue to apply as if the Separation Time had not occurred, and the Separation Time will be deemed not to have occurred and we shall be deemed to have issued replacement rights to the holders of its then outstanding Common Shares.

Amendment to the Rights Plan

The Rights Plan may be amended to correct any clerical or typographical error or to make such changes as are required to maintain the validity of the Rights Plan as a result of any change in any applicable legislation, regulations or rules thereunder, without the approval of the holders of the Common Shares or rights. Prior to the Separation Time, we may, with the prior consent of the holders of Common Shares, amend, vary or delete any of the provisions of the Rights Plan in order to effect any changes which the Board, acting in good faith, considers necessary or desirable. We may, with the prior consent of the holders of rights, at any time after the Separation Time and before the Expiration Time, amend, vary or delete any of the provisions of the Rights Plan.

Protection Against Dilution

The Exercise Price, the number and nature of securities which may be purchased upon the exercise of rights and the number of rights outstanding are subject to adjustment from time to time to prevent dilution in the event of stock dividends, subdivisions, consolidations, reclassifications or other changes in the outstanding Common Shares, pro rata distributions to holders of Common Shares and other circumstances where adjustments are required to appropriately protect the interests of the holders of rights.

Fiduciary Duty of Board

The Rights Plan will not detract from or lessen the duty of the Board to act honestly and in good faith with a view to our best interests and the best interests of our shareholders. The Board will continue to have the duty and power to take such actions and make such recommendations to our shareholders as are considered appropriate.

Exemptions for Investment Advisors

Fund managers, investment advisors (for fully-managed accounts), trust companies (acting in their capacities as trustees and administrators), statutory bodies whose business includes the management of funds, and administrators of registered pension plans are exempt from triggering a Flip-in Event, provided that they are not making, or are not part of a group making, a take-over bid.

Term

The Rights Plan will expire on the earlier of (i) the Termination Time; and (ii) the Close of Business on the date on which the annual meeting of the Company to be held in 2023 and at every third annual meeting of the Company thereafter (each such annual meeting being a “**Reconfirmation Meeting**”) occurs and at which the Rights Plan is not reconfirmed or presented for reconfirmation as contemplated in the Rights Plan (the “**Expiration Time**”).

Action Necessary to Change Rights of Shareholders

In order to change the rights of our shareholders, we would need to amend our Articles to effect the change. Such an amendment would require the approval of holders of two-thirds of the issued and outstanding shares cast at a duly called special meeting. For certain amendments, a shareholder is entitled under the CBCA to dissent in respect of such a resolution amending the Articles and, if the resolution is adopted and we implement such changes, demand payment of the fair value of its shares.

Disclosure of Share Ownership

In general, under applicable securities regulation in Canada, a person or company who beneficially owns, or who directly or indirectly exercises control or direction over voting securities of a reporting issuer, voting securities of an issuer or a combination of both, carrying more than ten percent of the voting rights attached to all the issuer’s outstanding voting securities is an insider and must,

within ten days of becoming an insider, file a report in the required form effective the date on which the person became an insider, disclosing any direct or indirect beneficial ownership of, or control or direction over, securities of the reporting issuer.

Additionally, securities regulation in Canada provides for the filing of a report by an insider of a reporting issuer whose holdings change, which report must be filed within five days from the day on which the change takes place.

Section 13 of the Exchange Act imposes reporting requirements on persons who acquire beneficial ownership (as such term is defined in the Rule 13d-3 under the Exchange Act) of more than five percent of a class of an equity security registered under Section 12 of the Exchange Act. Our Common Shares are so registered. In general, such persons must file, within ten days after such acquisition, a report of beneficial ownership with the SEC containing the information prescribed by the regulations under Section 13 of the Exchange Act. This information is also required to be sent to the issuer of the securities and to each exchange where the securities are traded.

The bylaws of the Company do not require disclosure of share ownership.

Meeting of Shareholders

An annual meeting of shareholders is held each year for the purpose of considering the financial statements and reports, electing directors, appointing auditors and fixing or authorizing the Board to fix their remuneration and for the transaction of other business as may properly come before a meeting of shareholders. Any annual meeting may also constitute a special meeting to take cognizance and dispose of any matter of which a special meeting may take cognizance and dispose. Under the bylaws, our Chief Executive Officer or our President has the power to call a meeting of shareholders.

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The CBCA provides that the holders of not less than 5% of our outstanding voting shares may requisition our directors to call a meeting of shareholders for the purpose stated in the requisition. Except in limited circumstances, including where a meeting of shareholders has already been called and a notice of meeting already given or where it is clear that the primary purpose of the requisition is to redress a personal grievance against us or our directors, officers or shareholders, our directors, on receipt of such requisition, must call a meeting of shareholders. If the directors fail to call a meeting of shareholders within twenty-one days after receiving the requisition, any shareholder who signed the requisition may call the meeting of shareholders and, unless the shareholders resolve otherwise at the meeting, we shall reimburse the shareholders for the expenses reasonably incurred by them in requisitioning, calling and holding the meeting of shareholders.

The CBCA also provides that, except in limited circumstances, a resolution in writing signed by all of the shareholders entitled to vote on that resolution at a meeting of shareholders is as valid as if it had been passed at a meeting of shareholders.

A quorum of shareholders is present at an annual or special meeting of shareholders, regardless of the number of persons present in person at the meeting, if the holder(s) of shares representing at least 10% of the outstanding voting shares at such meeting are present in person or represented in accordance with our bylaws. In the case where the CBCA, our Articles or our bylaws require or permit the vote by class of holders of a given class of shares of our share capital, the quorum at any meeting will be one or more persons representing 10% of the outstanding shares of such class.

Notice of the time and place of each annual or special meeting of shareholders must be given not less than 21 days, nor more than 50 days, before the date of each meeting to each director, to the auditor and to each shareholder entitled to vote thereat. If the address of any shareholder, director or auditor does not appear in our books, the notice may be sent to such address as the person sending the notice may consider to be most likely to reach such shareholder, director or auditor promptly. Every person who, by operation of the CBCA, transfers or by any other means whatsoever, becomes entitled to any share, shall be bound by every notice given in respect of such share which, prior to the entry of his or her name and address on our register, is given to the person whose name appears on the register at the time such notice is sent. Notice of meeting of shareholders called for any other purpose other than consideration of the financial statements and auditor's report, election of directors and reappointment of the incumbent auditor, must state the nature of the business in sufficient detail to permit the shareholder to form a reasoned judgment on and must state the text of any special resolution or bylaw to be submitted to the meeting.

Our bylaws include an advance notice provision (the "**Advance Notice Requirement**"). The Advance Notice Requirement applies in certain circumstances where nominations of persons for election to the Board are made by our shareholders other than pursuant to: (a) a requisition of a meeting made pursuant to the provisions of the CBCA; or (b) a shareholder proposal made pursuant to the provisions of the CBCA.

Among other things, the Advance Notice Requirement fixes a deadline by which shareholders must submit a notice of director nominations to us prior to any annual or special meeting of shareholders where directors are to be elected and sets forth the information that a shareholder must include in the notice for it to be valid. In the case of an annual meeting of shareholders, we must be given not less than 30 nor more than 65 days' notice prior to the date of the annual meeting; provided, however, that in the event that the annual meeting is to be held on a date that is less than 50 days after the date on which the first public announcement of the date of the annual meeting was made, notice may be made not later than the close of business on the 10th day following such public announcement. In the case of a special meeting of shareholders (which is not also an annual meeting), we must be given notice not later than the close of business on the 15th day following the day on which the first public announcement of the date of the special meeting was made.

The Board may, in its sole discretion, waive any requirement of the Advance Notice Requirement.

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Limitations on Right to Own Securities

Neither Canadian law nor our Articles or bylaws limit the right of a non-resident to hold or vote our Common Shares, other than as provided in the *Investment Canada Act* (the “**Investment Act**”).

The Investment Act requires any person that is a “non-Canadian” (as defined in the Investment Act) who acquires “control” (as defined in the Investment Act) of an existing Canadian business to file either a pre-closing application for review or a post-closing notification with Innovation, Science and Economic Development Canada.

As of the date hereof, the threshold for review of a direct acquisition of control of a non-cultural Canadian business by a World Trade Organization member country investor that is not a state-owned enterprise is an enterprise value of assets that exceeds CAN\$1.287 billion. For “trade agreement investors” that are not state-owned enterprises (as defined in the Investment Act), the threshold for review of a direct acquisition of control of a non-cultural Canadian business is an enterprise value of assets that exceeds CAN\$1.931 billion. The enterprise value review thresholds for both World Trade Organization member countries and trade agreement investors are indexed to annual GDP growth and are adjusted accordingly each year. For purposes of a publicly traded company, the “enterprise value” of the assets of the Canadian business is equal to the market capitalization of the entity, plus its liabilities (excluding its operating liabilities), minus its cash and cash equivalents.

As such, under the Investment Act, the acquisition of control of us (either through the acquisition of our Common Shares or all or substantially all our assets) by a non-Canadian who is a World Trade Organization member country investor or a trade agreement investor, including a U.S. investor, would be reviewable only if the enterprise value of our assets exceeds the specified threshold for review.

Where the acquisition of control is a reviewable transaction, the Investment Act generally prohibits the implementation of the reviewable transaction unless, after review, the relevant Minister is satisfied or deemed to be satisfied that the acquisition is likely to be of net benefit to Canada.

The acquisition of a majority of the voting interests of an entity is deemed to be acquisition of “control” of that entity. The acquisition of less than a majority but one-third or more of the total number of votes attached to all of the voting shares of a corporation or of an equivalent undivided ownership interest in the total number of votes attached to all of the voting shares of the corporation is presumed to be an acquisition of control of that corporation unless it can be established that, on the acquisition, the corporation is not controlled in fact by the acquiror through the ownership of voting shares. The acquisition of less than one-third of the total number of votes attached to all of the voting shares of a corporation is deemed not to be acquisition of control of that corporation subject to certain discretionary rights relative to investments involving state-owned enterprises. Other than in connection with a “national security” review, discussed below, certain transactions in relation to our Common Shares would be exempt from the Investment Act including:

- the acquisition of our Common Shares by a person in the ordinary course of that person’s business as a trader or dealer in securities;
- the acquisition or control of us in connection with the realization of security granted for a loan or other financial assistance and not for any purpose related to the provisions of the Investment Act, if the acquisition is subject to approval under the Bank Act, the Cooperative Credit Associations Act, the Insurance Companies Act or the Trust and Loan Companies Act; and
- the acquisition or control of us by reason of an amalgamation, merger, consolidation or corporate reorganization following which the ultimate direct or indirect control in fact of us, through the ownership of our voting interests, remains unchanged.

Under the national security regime in the Investment Act, review on a discretionary basis may also be undertaken by the federal government in respect of a much broader range of investments by a non-Canadian to “acquire, in whole or in part, or to establish an entity carrying on all or any part of its operations in Canada”. The relevant test is whether such an investment by a non-Canadian could be “injurious to national security”. The Minister of Innovation, Science and Economic Development has broad discretion to determine whether an investor is a non-Canadian and therefore may be subject to national security review. Review on national security grounds is at the discretion of the federal government and may occur on a pre- or post-closing basis.

There is no law, governmental decree or regulation in Canada that restricts the export or import of capital, or which would affect the remittance of dividends or other payments by us to non-resident holders of our Common Shares, other than withholding tax requirements.

C. Material contracts

The following are the only material agreements of the Company that are in effect as of the date hereof (other than certain agreements entered into in the ordinary course of business):

- the United States and Canada License Agreement (as described below); and
- the Licensing Agreement with Consilient Health (as described below).

United States and Canada License Agreement

On January 16, 2018, the Company, through AEZS Germany, entered into a License Agreement with Strongbridge, to carry out development, manufacturing, registration and commercialization of Macrilen™ (macimorelin) in the U.S. and Canada, and received a cash payment of \$24 million (the “**2018 Agreement**”).

Effective December 19, 2018, Strongbridge sold its rights to Macrilen™ (macimorelin) in Canada and the U.S. to Novo, and Novo agreed to fund Strongbridge’s Macrilen™ (macimorelin) field organization as a contract field force to promote the product in the U.S. for up to three years. This service agreement was terminated as of December 1, 2019.

On November 16, 2020, the Company announced that, through a wholly owned subsidiary, it had entered into an amendment (the “**Amendment**”) of its existing License Agreement with Novo related to the development and commercialization of macimorelin. Under the terms of the original License Agreement, Novo was granted the exclusive right to commercialize macimorelin in the U.S. and Canada. Novo is currently marketing macimorelin in the U.S. under the tradename Macrilen™ for the diagnosis of AGHD. The Amendment was intended to amend the 2018 Agreement to, among others:

- Reflect the updated supply arrangement between the parties relating to the supply of the API Macimorelin acetate;
- Grant Novo a joint ownership interest in the Aeterna Patent Rights and Trademarks;
- Amend responsibility between the Parties for the pediatric clinical trial for the Pediatric Indication (100% cost reimbursement up to EUR 9 million and 50% of exceeding costs per the Amendment, as compared to a total of 70% of costs in the 2018 Agreement); and
- Modify the future payment obligations, i.e. reduction of royalty rate and waiver by the Company of the future regulatory milestone payment on FDA approval of Pediatric Indication.

Under the Amendment, Aeterna continued to retain all rights to macimorelin outside of the U.S. and Canada, but Novo agreed to make an upfront payment to Aeterna of \$6.1 million (€5.0 million), which the Company received in December 2020. Under the Amendment, the royalty payment Aeterna receives on sales in the U.S. and Canada was reduced from 15% to 8.5% for annual net sales up to U.S.\$40 million and returns to 15% or more for annual net sales of macimorelin over U.S.\$40 million. Additionally, the \$5 million variable payment owing to Aeterna by Novo, upon FDA approval of the pediatric indication, was waived. Under the Amendment, Novo and Aeterna agreed that solely Aeterna will conduct the pivotal Study P02 in partnership with a contract research organization (“CRO”). Given the transfer of development activities to Aeterna, the percentage of Study P02 clinical trial costs that Novo is required to reimburse to Aeterna was adjusted from 70% to 100% of costs up to €9.0 million (approximately \$10.9 million). Any additional external jointly approved Study P02 trial costs incurred over €9.0 million will be shared equally between Novo and Aeterna. In addition, certain changes to rights and responsibilities of the joint steering committee were made

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Under the Amendment, both companies will continue to closely coordinate the activities related to the development and commercialization of macimorelin in the U.S. and Canada through a joint steering committee, with each party having decision rights in certain areas. Novo will also receive co-ownership of the U.S. and Canadian patents and trademarks owned by Aeterna on macimorelin but will be required to transfer co-ownership in those patents back to Aeterna on the occurrence of certain termination events.

In addition, upon regulatory approval of macimorelin in the U.S. for the diagnosis of CGHD, if Novo determines not to commercialize macimorelin in Canada, then Aeterna has the option to exclusively license rights to macimorelin in Canada (but not in U.S.) to a third party. The Amendment also confirms that Aeterna has the right to use the results from Study P02, if successful, to support Aeterna in seeking regulatory approval and in its ongoing efforts to seek partnering opportunities for macimorelin in Europe and other regions outside of the two countries licensed to Novo, the U.S. and Canada.

Under the Amendment, for as long as Macrilen™ (macimorelin) is patent-protected, the Company will be entitled to a 8.5% royalty on net sales up to \$40 million, 15% royalty on net sales between \$40 million and \$75 million, and an 18% royalty on net sales above \$75 million. Following the end of patent protection in the U.S. or Canada for Macrilen™ (macimorelin), the Company will be entitled to a 5% royalty on net sales in that country.

In addition, the Company will also receive one-time payments from Novo following the first achievement of the following commercial milestone events:

- \$4 million on achieving \$25 million annual net sales,
- \$10 million on achieving \$50 million annual net sales,
- \$20 million on achieving \$100 million annual net sales,
- \$40 million on achieving \$200 million annual net sales, and
- \$100 million on achieving \$500 million annual net sales.

The Amendment will expire at the end of a defined royalty period in each of the U.S. and Canada, at which time the license that the Company granted will become irrevocable, fully paid-up, perpetual and royalty-free in such country. The licensee has the right to terminate the Amendment if there is a safety concern related to Macrilen™ (macimorelin), withdrawal of regulatory approval for Macrilen™ (macimorelin) in the U.S. believed to be permanent, two hundred and seventy (270) days prior written notice, or if the Company commits a material breach of any term of the Amendment that it fails to cure within ninety (90) days after receiving written notice of the breach. The Company has the right to terminate the Amendment if the licensee commits a material breach of any term of the Amendment that it fails to cure within ninety (90) days after receiving written notice of the breach. If the breach relates to Canada then the Company shall only have the right to terminate the Amendment in relation to Canada. If the breach relates to the U.S., then the Company shall have the right to terminate the Amendment in its entirety. If Novo terminates the Amendment early or the Company terminates because of a material breach by Novo, then the joint ownership rights will be returned to the Company.

The Amendment contains customary provisions related to, among other things, confidentiality and non-disclosure, representations and warranties, indemnity and dispute resolution. The Amendment is governed by the laws of Switzerland.

On August 26, 2022, Novo provided the Company with a notice of termination of the Novo Amendment. Under the terms of the Novo Amendment, the termination is effective May 23, 2023 upon the completion of a 270 day notice period (“notice period”). Upon termination, the rights and licenses granted by the Company to Novo under the Novo Amendment will be returned to the Company, and the Company will regain full rights to continue the clinical development and future commercialization of Macrilen™. Following the notice of termination and throughout the 270 day notice period, Novo will continue to fund all DETECT-trial costs up to \$9.6 million (€9 million), and any additional DETECT-trial costs incurred over \$9.6 million (€9 million) up to \$10.5 million (€9.8 million) will be shared equally between Novo and the Company.

European Economic Area and United Kingdom License Agreement

On December 7, 2020, the Company entered into an exclusive licensing agreement with Consilient Health Limited (“CH”) for the commercialization of macimorelin (the “Licensed Product”) in the European Economic Area and the United Kingdom (the “CH License Agreement”).

Under the terms of the CH License Agreement, CH agreed to make a non-refundable, non-creditable upfront payment to the Company of \$1.2 million (€1.0 million), which the Company received in January 2021. The Company also is eligible to receive additional consideration, including regulatory milestones related to agreed-upon pricing and reimbursement parameters; net sales milestones; and royalties, ranging from 10%-20% of net sales of macimorelin, subject to reduction in certain cases, or sublicense income recorded by CH. Also on December 7, 2020, the Company and CH entered into an exclusive supply agreement, pursuant to which the Company agreed to provide the Licensed Product to CH, with such Licensed Product to be manufactured by third-party manufacturers for a period of ten years, subject to renewal (the “CH Supply Agreement”).

As consideration for the right to commercialize the licensed product, CH has agreed certain milestones as summarized below:

One-time payment (non-refundable and non-creditable)

- Payment of Euro 1 million thirty (30) days after the effective date of the Licensing Agreement;

Paediatric Use Regulatory payment (non-refundable and non-creditable)

- Grant of first marketing authorization from the European Commission for Paediatric Use of Euro 500,000.

Regulatory payments (non-refundable and non-creditable)

- Upon receipt of pricing and reimbursement approval in France, Germany, Italy, Spain and the United Kingdom upon price per test of:
- Above Euro 300: Euro 200,000 per country;
- Euro 250 to Euro 300: Euro 100,000 per country; and
- Achievement of a mean average reimbursement price of above Euro 300 in France, Germany, Italy, Spain and UK of Euro 500,000.

Commercial milestones (non-refundable and non-creditable)

- Annual net sales reaching Euro 4 million for payment of Euro 250,000;
- Annual net sales reaching Euro 6 million for payment of Euro 400,000;
- Annual net sales reaching Euro 8 million for payment of Euro 600,000; and
- Annual net sales reaching Euro 10 million for payment of Euro 1,000,000.

Royalties

- 10.0% for up to Euro 2 million annual net sales;
- 12.5% between Euro 2 million and Euro 3 million net sales;
- 15.0% between Euro 3 million and Euro 4 million net sales; and
- 20.0% for above Euro 4 million net sales.

Sublicense Income Royalty

- 10.0% on any form of consideration other than running royalties on net sales

The license remains in full force and effect (i) as long as the licensed product is covered by a valid claim in any country covered by the licensing agreement; (ii) the expiration of any regulatory marketing exclusivity period or other statutory designation that provides similar exclusivity for the commercialization of the licensed product in any country covered by the licensing agreement; or (iii) on a country by country of the covered territory, and licensed product by licensed product basis, for a period of ten (10) years after the first commercial sale date in the respective country, whichever term is longer, subject to renewal. The licensee has the right to terminate the license in certain circumstances.

Employment and Service Agreements

We, or one of our subsidiaries, had entered into an employment agreement and, in some cases, a change of control agreement with each of our Named Executive Officers.

Klaus Paulini

We entered into an employment agreement with Dr. Klaus Paulini, effective as of October 4, 2019 (the “**Employment Agreement**”) for his position as Chief Executive Officer of the Corporation. The Corporation, through AEZS Germany, also entered into a service agreement with Dr. Klaus Paulini effective as of July 26, 2019 (the “**Services Agreement**”) for his position as Managing Director of AEZS Germany. The Employment Agreement provides that we will pay Dr. Paulini (the “**Executive**”) an initial base salary of €260,000

per annum, which includes payment for his service as Managing Director of AEZS Germany. Additionally, pursuant to the Employment Agreement, we provided the Executive with an initial grant of 35,000 stock options in November 2019. Under the terms of the Services Agreement, the Executive may receive subsequent grants of stock options at the discretion of the Board of Directors or the NGCC, an annual bonus subject to the determination and approval of the NGCC and participation in an employer sponsored pension scheme.

If there is a termination of the Executive's employment by us without "Cause", then the Executive will be entitled to receive a severance payment in the amount equal to €300,000.

The Employment Agreement contains customary confidentiality, intellectual property and non-disparagement covenants.

For the purposes of the Employment Agreement, termination of employment for "Cause" includes (but is not limited to) (i) if the Executive commits any fraud, theft, embezzlement or other criminal act of a similar nature, and (ii) if the Executive has committed serious misconduct or willful negligence in the performance of his duties.

Leslie Auld

We entered into a consulting agreement with Leslie Auld, Senior Vice President, Chief Financial Officer, effective as of September 24, 2018 (the "**Consulting Agreement**"). The Consulting Agreement provides that Ms. Auld (the "**Consultant**") will perform specified services for us for up to 120 hours per month. The Consultant will be paid CAN\$150 per hour (plus HST) (the "**base fees**") for these services. Additionally, the Consultant will be paid for up to eight (8) hours of travel time per round trip, at a rate of CAN\$150 per hour.

The Consulting Agreement may be terminated by either party for convenience, upon thirty (30) days written notice. The Consulting Agreement may also be terminated by us upon the material breach or default of any provision of the Consulting Agreement by the Consultant, immediately upon the Consultant's death or upon the parties' mutual agreement. In the event of termination, the Consultant will be entitled to receive any outstanding base fees and reimbursement for incurred expenses to the effective date of termination.

The Consulting Agreement provides the Consultant indemnifies us from and against any and all claims, costs, liabilities, damages, charges and expenses arising out of the Consulting Agreement or the services, including in respect of misclassification.

Ms. Auld concluded her Consulting Agreement effective March 31, 2022.

Giuliano La Fratta

AEZS Inc entered into an employment agreement in January 2002 with Giuliano La Fratta, Senior Vice President, Finance and Chief Financial Officer ("**CFO**"). In accordance with the terms of his employment agreement, Mr. La Fratta will receive a RRSP Contribution equal to 5% of his Base Salary.

If there is a termination of the Executive's employment by us without "Cause", then the Executive will be entitled to receive a severance payment depending on the length of his service. At the end of December 31, 2022 the Executive will be entitled to receive a severance payment in the amount equal to \$137,500 CAD.

AEZS entered into a change of control agreement with Mr. La Fratta on November 18, 2022. In the event of a "Change of Control" (as defined in the change of control agreement), Mr. La Fratta will be entitled to receive:

- all accrued obligations under his employment agreement;
- a severance payment equal to 18 months of his base salary;
- an amount equal to his annual bonus for the year in which the Change of Control occurs;
- an amount equal to 1.5 times the annual bonus based on the target annual bonus for the year in which the Change of Control occurs;
- a cash amount equal to 1.5 times the annual premium cost to the Corporation of providing his insured health benefits; and

all outstanding options will automatically vest upon the Change of Control.

Matthias Gerlach

AEZS Germany entered into an employment agreement in January 2001 with Dr. Gerlach, Vice President Manufacturing and Supply Chain. In accordance with the terms of his employment agreement, Dr. Gerlach will receive a pension payment after he has reached the statutory retirement age, independent of whether he works with AEZS Germany until such age, in an amount to be based on the contributions that were made during his employment with AEZS Germany.

Eckhard Guenther

AEZS Germany entered into an employment agreement in 1990 with Dr. Guenther, Vice President Business Development & Alliance Management. In accordance with the terms of his employment agreement, Dr. Guenther will receive a pension payment after he has reached the statutory retirement age, independent of whether he works with AEZS Germany until such age, in an amount to be based on the contributions that were made during his employment with AEZS Germany.

Nicola Ammer

AEZS Germany entered into an employment agreement in April 2015 with Dr. Ammer, Chief Medical Officer and Senior Vice President Clinical Development. In accordance with the terms of her employment agreement, Dr. Ammer will receive a pension payment after

she has reached the statutory retirement age, independent of whether she works with AEZS Germany until such age, in an amount to be based on the contributions that were made during her employment with AEZS Germany.

Name	Termination Provisions Value (\$) ⁽¹⁾ ⁽²⁾
Ammer, Nicola	—
La Fratta, Giuliano	101,338
Gerlach, Matthias	—
Guenther, Eckhard	—
Paulini, Klaus	321,969

(1) The termination values assume that the triggering event took place on the last business day of our financial year-end (December 31, 2022).

(2) Value of earned/unused vacation, if applicable, and amounts owing for expense reimbursement are not included as they are not considered as “incremental” payments made in connection with termination of employment.

D. Exchange controls

Canada has no system of exchange controls. There are no exchange restrictions on borrowing from foreign countries or on the remittance of dividends, interest, royalties and similar payments, management fees, loan repayments, settlement of trade debts or the repatriation of capital.

E. Taxation

THE FOLLOWING SUMMARY IS OF A GENERAL NATURE ONLY AND IS NOT INTENDED TO BE, NOR SHOULD IT BE CONSTRUED TO BE, LEGAL OR TAX ADVICE TO ANY PARTICULAR HOLDER. CONSEQUENTLY, HOLDERS ARE URGED TO CONSULT THEIR OWN TAX ADVISORS FOR ADVICE AS TO THE TAX CONSEQUENCES OF AN INVESTMENT IN THE COMMON SHARES HAVING REGARD TO THEIR PARTICULAR CIRCUMSTANCES.

Material Canadian Income Tax Considerations

The following summary describes the principal Canadian federal income tax considerations applicable to a holder of Common Shares and who, for the purposes of the Canadian federal Income Tax Act, R.S.C. 1985, as amended (the “**Tax Act**”), and at all relevant times, deals at arm’s length with, and is not affiliated with, the Company and holds their Common Shares as capital property (a “**holder**”). Common Shares will generally be considered to be capital property to a holder for purposes of the Tax Act unless either the holder holds such Common Shares in the course of carrying on a business of trading or dealing in securities, or the holder has held or acquired such Common Shares in a transaction or transactions considered to be an adventure in the nature of trade.

This summary is not applicable to a holder (i) that is a “financial institution”, as defined in the Tax Act for purposes of the mark-to-market rules, (ii) that is a “specified financial institution”, as defined in the Tax Act, (iii) an interest in which would be a “tax shelter investment” as defined in the Tax Act, (iv) that has made a functional currency reporting election for purposes of the Tax Act, (v) that has entered or will enter into a “derivative forward agreement”, as defined in the Tax Act, in respect of Common Shares, or (vi) that receives dividends on Common Shares under or as part of a dividend rental arrangement as defined in the Tax Act. Such holders should consult their own tax advisors.

Additional considerations, not discussed herein, may be applicable to a holder that is a corporation resident in Canada, and is, or becomes, or does not deal at arm’s length for purposes of the Tax Act with a corporation resident in Canada that is or becomes, as part of a transaction or series of transactions or events that includes the acquisition of the Common Shares, controlled by a non-resident person or a group of non-resident persons not dealing with each other at arm’s length for the purposes of the “foreign affiliate dumping” rules in section 212.3 of the Tax Act. Such holders should consult their tax advisors with respect to the consequences of acquiring Common Shares.

This summary is based upon the current provisions of the Tax Act and the regulations promulgated thereunder (the “**Regulations**”) and the Company’s understanding of the current published administrative policies and assessing practices of the Canada Revenue Agency (“**CRA**”). It also takes into account all proposed amendments to the Tax Act and the Regulations publicly released by the Minister of Finance (Canada) prior to the date hereof (“**Tax Proposals**”), and assumes that all such Tax Proposals will be enacted as currently proposed. No assurance can be given that the Tax Proposals will be enacted in the form proposed or at all. This summary does not otherwise take into account or anticipate any changes in law or administrative or assessing practice or policy of the CRA, whether by legislative, regulatory, judicial or administrative action or interpretation, nor does it address any provincial, local, territorial or foreign tax considerations.

For purposes of the Tax Act, all amounts, including dividends, adjusted cost base and proceeds of disposition, must generally be determined in Canadian dollars. Amounts denominated in a foreign currency must be converted to Canadian currency using exchange rates determined in accordance with the Tax Act. The amount of any capital gain or any capital loss to a holder with respect to the Common Shares may be affected by fluctuations in Canadian dollar exchange rates.

The following discussion applies to a holder who, at all relevant times, for purposes of the Tax Act, is neither resident nor deemed to be resident in Canada and does not, and is not deemed to, use or hold Common Shares in carrying on a business or part of a business in Canada (a “**Non-Resident holder**”). In addition, this discussion does not apply to an insurer who carries or is deemed to carry on, an insurance business in Canada and elsewhere.

Disposition of Common Shares

A Non-Resident holder generally will not be subject to tax under the Tax Act in respect of any capital gain realized by such Non-Resident holder on a disposition or deemed disposition of Common Shares unless such shares constitute “taxable Canadian property” (as defined in the Tax Act) of the Non-Resident holder at the time of disposition and the gain is not exempt from tax pursuant to the terms of an applicable income tax treaty or convention. As long as the Common Shares are listed on a designated stock exchange (which currently includes the NASDAQ and the TSX) at the time of their disposition, the Common Shares generally will not constitute taxable Canadian property of a Non-Resident holder, unless (a) at any time during the 60-month period immediately preceding the disposition (i) one or any combination of (A) the Non-Resident holder, (B) persons with whom the Non-Resident holder did not deal at arm’s length, and (C) partnerships in which the Non-Resident holder or a person described in (B) holds a membership interest directly or indirectly through one or more partnerships, owned 25% or more of the issued shares of any class or series of shares of the Company; and (ii) more than 50% of the fair market value of the shares of the Company was derived directly or indirectly from one or any combination of real or immovable property situated in Canada, “Canadian resource properties” (as defined in the Tax Act), “timber resource properties” (as defined in the Tax Act) or options in respect of, or interests in, or for civil law rights in, any such property whether or not such property exists or (b) the Common Shares are otherwise deemed to be taxable Canadian property to the Non-Resident holder.

A Non-Resident holder’s capital gain (or capital loss) in respect of Common Shares that constitute or are deemed to constitute taxable Canadian property (and are not “treaty-protected property” as defined in the Tax Act) will generally be computed in the manner described below under the heading “Holders Resident in Canada - Disposition of Common Shares”. If the Common Shares were to cease being listed on the NASDAQ, the TSX or another “recognized stock exchange” (as defined in the Tax Act), a Non-Resident holder who disposes of Common Shares that are taxable Canadian property may be required to fulfill the requirements of section 116 of the Tax Act, unless the Common Shares are “treaty-protected property” (as defined in the Tax Act) of the disposing Non-Resident holder.

Non-Resident holders whose Common Shares are taxable Canadian property should consult their own tax advisors.

Taxation of Dividends on Common Shares

Dividends paid or credited or deemed to be paid or credited to a Non-Resident holder by the Company are subject to Canadian withholding tax at the rate of 25% unless reduced by the terms of an applicable tax treaty or convention. Under the Canada - United States Tax Convention (1980) (the “**Convention**”) as amended, the rate of withholding tax on dividends paid or credited to a Non-Resident holder who is the beneficial owner of the dividends, is resident in the U.S. for purposes of the Convention and entitled to the benefits of the Convention (a “**U.S. holder**”) is generally limited to 15% of the gross amount of the dividend (or 5% in the case of a U.S. holder that is a company beneficially owning at least 10% of the Company’s voting shares). Non-Resident holders should consult their own tax advisors.

Holders Resident in Canada

The following discussion applies to a holder of Common Shares who, at all relevant times, for purposes of the Tax Act, is or is deemed to be resident in Canada (a “**Canadian holder**”). Certain Canadian holders whose Common Shares might not otherwise qualify as capital property may, in certain circumstances, treat the Common Shares and every other “Canadian security” (as defined in the Tax Act) owned by the Canadian holder as capital property by making an irrevocable election provided by subsection 39(4) of the Tax Act. Canadian holders should consult their own tax advisors for advice as to whether an election under subsection 39(4) of the Tax Act is available and/or advisable in their particular circumstances.

Taxation of Dividends on Common Shares

Dividends received or deemed to have been received on the Common Shares will be included in a Canadian holder’s income for purposes of the Tax Act. Such dividends received or deemed to have been received by a Canadian holder that is an individual (other than certain trusts) will be subject to the gross-up and dividend tax credit rules generally applicable under the Tax Act in respect of dividends received on shares of taxable Canadian corporations. Generally, a dividend will be eligible for the enhanced gross-up and dividend tax credit if the Company designates the dividend as an “eligible dividend” (within the meaning of the Tax Act) in accordance with the provisions of the Tax Act. There may be limitations on the ability of the Company to designate dividends as eligible dividends. A Canadian holder that is a corporation will be required to include such dividends in computing its income and will generally be entitled to deduct the amount of such dividends in computing its taxable income. In certain circumstances, subsection 55(2) of the Tax Act may treat a taxable dividend received by a Canadian holder that is a corporation as proceeds of disposition or a capital gain. A Canadian holder that is a “private corporation” or a “subject corporation” (as such terms are defined in the Tax Act), may be liable under Part IV of the Tax Act to pay a refundable tax on dividends received or deemed to have been received on the Common Shares to the extent such dividends are deductible in computing the holder’s taxable income.

Disposition of Common Shares

A disposition, or a deemed disposition, of a Common Share by a Canadian holder will generally give rise to a capital gain (or a capital loss) equal to the amount by which the proceeds of disposition of the share, net of any reasonable costs of disposition, exceed (or are less than) the adjusted cost base of the share to the holder. Such capital gain (or capital loss) will be subject to the treatment described below under “Taxation of Capital Gains and Capital Losses”.

Additional Refundable Tax

A Canadian holder that is a “Canadian-controlled private corporation” (as such term is defined in the Tax Act) may be liable to pay an additional refundable tax on certain investment income including amounts in respect of “Taxable Capital Gains”, as defined below.

Taxation of Capital Gains and Capital Losses

In general, one half of any capital gain (a “**Taxable Capital Gain**”) realized by a Canadian holder in a taxation year will be included in the holder’s income in the year. Subject to and in accordance with the provisions of the Tax Act, one half of any capital loss (an “**Allowable Capital Loss**”) realized by a Canadian holder in a taxation year must be deducted from Taxable Capital Gains realized by the holder in the year and Allowable Capital Losses in excess of Taxable Capital Gains may be carried back and deducted in any of the three preceding taxation years or carried forward and deducted in any subsequent taxation year against net Taxable Capital Gains realized in such years. The amount of any capital loss realized by a Canadian holder that is a corporation on the disposition or deemed disposition of a Common Share may be reduced by the amount of dividends received or deemed to have been received by it on such Common Share (or on a share for which the Common Share has been substituted) to the extent and under the circumstances prescribed by the Tax Act. Similar rules may apply where a corporation is a member of a partnership or a beneficiary of a trust that owns Common Shares, directly or indirectly, through a partnership or a trust.

Alternative Minimum Tax

A Taxable Capital Gain realized and taxable dividends received or deemed to have been received by a Canadian holder who is an individual (including a trust, other than certain specified trusts) may give rise to liability for alternative minimum tax.

Material U.S. Federal Income Tax Considerations

The following discussion is a summary of the material U.S. federal income tax consequences applicable to the purchase, ownership and disposition of Common Shares by a U.S. Holder (as defined below), but does not purport to be a complete analysis of all potential U.S. federal income tax effects. This summary is based on the Internal Revenue Code of 1986, as amended (the “**Code**”), U.S. Treasury regulations promulgated thereunder, IRS rulings and judicial decisions in effect on the date hereof. All of these are subject to change, possibly with retroactive effect, or different interpretations. This summary does not discuss the potential effects, whether adverse or beneficial, of any proposed legislation that, if enacted, could be applied on a retroactive basis. This summary is not binding on the IRS, and the IRS is not precluded from taking a position that is different from, and contrary to, the positions taken in this summary.

This summary does not address all aspects of U.S. federal income taxation that may be relevant to particular U.S. Holders in light of their specific circumstances (for example, U.S. Holders subject to the alternative minimum tax or the Medicare contribution tax on net investment income under the Code) or to holders that may be subject to special rules under U.S. federal income tax law, including:

- dealers in stocks, securities or currencies;
- securities traders that use a mark-to-market accounting method;
- banks and financial institutions;
- insurance companies;
- regulated investment companies;
- real estate investment trusts;
- tax-exempt organizations;
- retirement plans, individual plans, individual retirement accounts and tax-deferred accounts;
- partnerships or other pass-through entities for U.S. federal income tax purposes and their partners or members;
- persons holding Common Shares as part of a hedging or conversion transaction straddle or other integrated or risk reduction transaction;
- persons who or that are, or may become, subject to the expatriation provisions of the Code;
- persons whose functional currency is not the U.S. dollar; and
- direct, indirect or constructive owners of 10% or more of the total combined voting power of all classes of our voting stock or 10% or more of the total value of shares of all classes of our stock.

This summary also does not address the tax consequences of holding, exercising or disposing of warrants in the Company. If the Company is a PFIC, as described below, U.S. Holders of its warrants will be subject to adverse tax rules and will not be able to make the mark-to-market or the QEF election described below with respect to such warrants. U.S. Holders of warrants should consult their tax advisors with regard to the U.S. federal income tax consequences of holding, exercising or disposing of warrants in the Company, including in the situation in which the Company is classified as a PFIC.

This summary also does not discuss any aspect of state, local or foreign law, or estate or gift tax law as applicable to U.S. Holders. In addition, this discussion is limited to U.S. Holders holding Common Shares as capital assets. For purposes of this summary, “U.S. Holder” means a beneficial holder of Common Shares who or that for U.S. federal income tax purposes is:

- an individual citizen or resident of the U.S.;
- a corporation or other entity classified as a corporation for U.S. federal income tax purposes created or organized in or under the laws of the U.S., any state thereof or the District of Columbia;
- an estate, the income of which is subject to U.S. federal income taxation regardless of its source; or
- a trust, if (a) a court within the U.S. is able to exercise primary supervision over the administration of such trust and one or more “U.S. persons” (within the meaning of the Code) have the authority to control all substantial decisions of the trust, or (b) a valid election is in effect to be treated as a U.S. person for U.S. federal income tax purposes.

If a partnership or other entity or arrangement classified as a partnership for U.S. federal income tax purposes holds Common Shares, the U.S. federal income tax treatment of a partner generally will depend on the status of the partner and the activities of the partnership. This summary does not address the tax consequences to any such partner. Such a partner should consult its own tax advisor as to the tax consequences of the partnership purchasing, owning and disposing of Common Shares.

U.S. HOLDERS SHOULD CONSULT THEIR OWN TAX ADVISORS WITH REGARD TO THE APPLICATION OF THE TAX CONSEQUENCES DESCRIBED BELOW TO THEIR PARTICULAR SITUATIONS AS WELL AS THE APPLICATION OF ANY STATE, LOCAL, FOREIGN OR OTHER TAX LAWS, INCLUDING GIFT AND ESTATE TAX LAWS.

Tax Consequences if we are a Passive Foreign Investment Company (“PFIC”)

A foreign corporation will be classified as a PFIC for any taxable year in which, after taking into account the income and assets of the corporation and certain subsidiaries pursuant to applicable “look-through rules”, either (i) at least 75% of its gross income is “passive income” or (ii) at least 50% of the average quarterly value of its assets is attributable to assets which produce passive income or are held for the production of passive income. Passive income generally includes dividends, interest, rents and royalties (other than certain rents and royalties derived in the active conduct of a trade or business), annuities and gains from assets that produce passive income. If a non-U.S. corporation owns at least 25% by value of the stock of another corporation, the non-U.S. corporation is treated for purposes of the PFIC tests as owning its proportionate share of the assets of the other corporation and as receiving directly its proportionate share of the other corporation’s income.

The Company believes it was a PFIC for the 2015 taxable year, but not for the taxable years 2016 through 2022. However, the fair market value of the Company’s assets may be determined in large part by the market price of the Common Shares, which is likely to fluctuate, and the composition of the Company’s income and assets will be affected by how, and how quickly, the Company spends any cash that is raised in any financing transaction. Thus, no assurance can be provided that the Company will not be classified as a PFIC for the 2022 taxable year or any future taxable year. U.S. Holders should consult their tax advisors regarding the Company’s PFIC status.

If the Company is classified as a PFIC for any taxable year during which a U.S. Holder owns Common Shares, the U.S. Holder, absent certain elections (including the mark-to-market and QEF elections described below), will generally be subject to adverse rules (regardless of whether the Company continues to be classified as a PFIC) with respect to (i) any “excess distributions” (generally, any distributions received by the U.S. Holder on the Common Shares in a taxable year that are greater than 125% of the average annual distributions received by the U.S. Holder in the three preceding taxable years or, if shorter, the U.S. Holder’s holding period for the Common Shares) and (ii) any gain realized on the sale or other disposition of the Common Shares.

Under these adverse rules (a) the excess distribution or gain will be allocated ratably over the U.S. Holder’s holding period, (b) the amount allocated to the current taxable year and any taxable year prior to the first taxable year in which the Company is classified as a PFIC will be taxed as ordinary income and (c) the amount allocated to each of the other taxable years during which the Company was classified as a PFIC will be subject to tax at the highest rate of tax in effect for the applicable category of taxpayer for that year and an interest charge will be imposed with respect to the resulting tax attributable to each such other taxable year. A U.S. Holder that is not a corporation will be required to treat any such interest paid as “personal interest”, which is not deductible.

U.S. Holders can avoid the adverse rules described above in part by making a mark-to-market election with respect to the Common Shares, provided that the Common Shares are “marketable”. The Common Shares will be marketable if they are “regularly traded” on a “qualified exchange” or other market within the meaning of applicable U.S. Treasury regulations. For this purpose, the Common Shares generally will be considered to be regularly traded during any calendar year during which they are traded, other than in de minimis quantities, on at least 15 days during each calendar quarter. The Common Shares are currently listed on the NASDAQ, which constitutes a qualified exchange; however, there can be no assurance that the Common Shares will be treated as regularly traded for purposes of the mark-to-market election on a qualified exchange. If the Common Shares were not regularly traded on the NASDAQ or were delisted from the NASDAQ and were not traded on another qualified exchange for the requisite time period described above, the mark-to-market election would not be available.

A U.S. Holder that makes a mark-to-market election must include in gross income, as ordinary income, for each taxable year an amount equal to the excess, if any, of the fair market value of the U.S. Holder’s Common Shares at the close of the taxable year over the U.S. Holder’s adjusted tax basis in the Common Shares. An electing U.S. Holder may also claim an ordinary loss deduction for the excess, if any, of the U.S. Holder’s adjusted tax basis in the Common Shares over the fair market value of the Common Shares at the close of the taxable year, but this deduction is allowable only to the extent of any net mark-to-market gains previously included in income. A U.S. Holder that makes a mark-to-market election generally will adjust such U.S. Holder’s tax basis in the Common Shares to reflect the amount included in gross income or allowed as a deduction because of such mark-to-market election. Gains from an actual sale or other disposition of the Common Shares will be treated as ordinary income, and any losses incurred on a sale or other disposition of the Common Shares will be treated as ordinary losses to the extent of any net mark-to-market gains previously included in income.

If the Company is classified as a PFIC for any taxable year in which a U.S. Holder owns Common Shares but before a mark-to-market election is made, the adverse PFIC rules described above will apply to any mark-to-market gain recognized in the year the election is made. Otherwise, a mark-to-market election will be effective for the taxable year for which the election is made and all subsequent taxable years. The election cannot be revoked without the consent of the IRS unless the Common Shares cease to be marketable, in which case the election is automatically terminated.

If the Company is classified as a PFIC, a U.S. Holder of Common Shares will generally be treated as owning stock owned by the Company in any direct or indirect subsidiaries that are also PFICs and will be subject to similar adverse rules with respect to distributions to the Company by, and dispositions by the Company of, the stock of such subsidiaries. A mark-to-market election is not permitted for the shares of any subsidiary of the Company that is also classified as a PFIC. U.S. Holders should consult their tax

advisors regarding the availability of, and procedure for making, a mark-to-market election.

In some cases, a shareholder of a PFIC can avoid the interest charge and the other adverse PFIC consequences described above by making a QEF election to be taxed currently on its share of the PFIC's undistributed income. We will endeavor to satisfy the record keeping requirements that apply to a QEF and to supply requesting U.S. Holders with the information that such U.S. Holders are required to report under the QEF rules. However, there can be no assurance that the Company will satisfy the record keeping requirements or provide the information required to be reported by U.S. Holders.

A U.S. Holder that makes a timely and effective QEF election for the first tax year in which its holding period of its Common Shares begins generally will not be subject to the adverse PFIC consequences described above with respect to its Common Shares. Rather, a U.S. Holder that makes a timely and effective QEF election will be subject to U.S. federal income tax on such U.S. Holder's pro rata share of (a) the Company's net capital gain, which will be taxed as long-term capital gain to such U.S. Holder, and (b) the Company's ordinary earnings, which will be taxed as ordinary income to such U.S. Holder, in each case regardless of which such amounts are actually distributed to the U.S. Holder by the Company. Generally, "net capital gain" is the excess of (i) net long-term capital gain over (ii) net short-term capital loss, and "ordinary earnings" are the excess of (A) "earnings and profits" over (B) net capital gain.

A U.S. Holder that makes a timely and effective QEF election with respect to the Company generally (a) may receive a tax-free distribution from us to the extent that such distribution represents "earnings and profits" that were previously included in income by the U.S. Holder because of such QEF election and (b) will adjust such U.S. Holder's tax basis in the Common Shares to reflect the amount included in income or allowed as a tax-free distribution because of such QEF election. In addition, a U.S. Holder that makes a QEF election generally will recognize capital gain or loss on the sale or other taxable disposition of Common Shares.

The QEF election is made on a shareholder-by-shareholder basis. Once made, a QEF election will apply to the tax year for which the QEF election is made and to all subsequent tax years, unless the QEF election is invalidated or terminated or the IRS consents to revocation of the QEF election. In addition, if a U.S. Holder makes a QEF election, the QEF election will remain in effect (although it will not be applicable) during those tax years in which the Company is not a PFIC.

If the Company is classified as a PFIC and then ceases to be so classified, a U.S. Holder may make an election (a **"deemed sale election"**) to be treated for U.S. federal income tax purposes as having sold such U.S. Holder's Common Shares on the last day of the taxable year of the Company during which it was a PFIC. A U.S. Holder that made a deemed sale election would then cease to be treated as owning stock in a PFIC by reason of ownership of Common Shares in the Company. However, gain recognized as a result of making the deemed sale election would be subject to the adverse rules described above and loss would not be recognized.

If the Company is a PFIC in any year with respect to a U.S. Holder, the U.S. Holder will be required to file an annual information return on IRS Form 8621 regarding distributions received on Common Shares and any gain realized on the disposition of Common Shares.

In addition, if the Company is a PFIC, U.S. Holders will generally be required to file an annual information return with the IRS (also on IRS Form 8621, which PFIC shareholders are required to file with their U.S. federal income tax or information returns) relating to their ownership of Common Shares.

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.

Dividends

Subject to the PFIC rules discussed above, any distributions paid by the Company out of current or accumulated earnings and profits (as determined for U.S. federal income tax purposes), before reduction for any Canadian withholding tax paid with respect thereto, will generally be taxable to a U.S. Holder as foreign source dividend income, and generally will not be eligible for the dividends received deduction generally allowed to corporations.

Distributions in excess of current and accumulated earnings and profits will be treated as a non-taxable return of capital to the extent of the U.S. Holder's adjusted tax basis in the Common Shares and thereafter as capital gain. The Company does not, however, intend to calculate its earnings and profits under U.S. federal income tax principles. Therefore, U.S. Holders should expect that any distribution from the Company generally will be treated for U.S. federal income tax purposes as a dividend. U.S. Holders should consult their own tax advisors with respect to the appropriate U.S. federal income tax treatment of any distribution received from the Company.

Dividends paid to non-corporate U.S. Holders by the Company in a taxable year in which it is treated as a PFIC, or in the immediately following taxable year, will not be eligible for the special reduced rates normally applicable to long-term capital gains. In all other taxable years, dividends paid by the Company should be taxable to a non-corporate U.S. Holder at the special reduced rates normally applicable to long-term capital gains, provided that certain conditions are satisfied. (including a minimum holding period requirement). The Company believes it was not a PFIC for the 2020 taxable year. However, no assurance can be provided that the Company will not be classified as a PFIC for 2021 and, therefore, no assurance can be provided that a U.S. Holder will be able to claim a reduced rate for dividends paid in 2021 or 2022 (if any). Please see the subsection above entitled "Material U.S. Federal Income Tax Considerations—Tax Consequences if we are a Passive Foreign Investment Company" for a more detailed discussion.

Under current law, payments of dividends by the Company to non-Canadian investors are generally subject to a 25% Canadian withholding tax. The rate of withholding tax applicable to U.S. Holders that are eligible for benefits under the Canada-United States Tax Convention (the **"Convention"**) is reduced to a maximum of 15% (or 5% in the case of a U.S. holder that is a company beneficially owning at least 10% of the Company's voting shares). This reduced rate of withholding will not apply if the dividends received by a U.S. Holder are effectively connected with a permanent establishment of the U.S. Holder in Canada. For U.S. federal income tax purposes, U.S. Holders will be treated as having received the amount of Canadian taxes withheld by the Company, and as then having paid over the withheld taxes to the Canadian taxing authorities. As a result of this rule, the amount of dividend income

included in gross income for U.S. federal income tax purposes by a U.S. Holder with respect to a payment of dividends may be greater than the amount of cash actually received (or receivable) by the U.S. Holder from the Company with respect to the payment.

Subject to certain limitations, a U.S. Holder will generally be entitled, at the election of the U.S. Holder, to a credit against its U.S. federal income tax liability, or a deduction in computing its U.S. federal taxable income, for Canadian income taxes withheld by the Company. This election is made on a year-by-year basis and applies to all foreign taxes paid (whether directly or through withholding) by a U.S. Holder during a year. For purposes of the foreign tax credit limitation, dividends paid by the Company generally will constitute foreign source income in the “passive category income” basket. The foreign tax credit rules are complex and U.S. Holders should consult their tax advisors concerning the availability of the foreign tax credit in their particular circumstances.

Dividends paid in Canadian dollars will be included in the gross income of a U.S. Holder in a U.S. dollar amount calculated by reference to the exchange rate in effect on the date the U.S. Holder (actually or constructively) receives the dividend, regardless of whether such Canadian dollars are actually converted into U.S. dollars at that time. If the Canadian dollars received are not converted into U.S. dollars on the date of receipt, a U.S. Holder will have a tax basis in the Canadian dollars equal to their U.S. dollar value on the date of receipt. Gain or loss, if any, realized on a sale or other disposition of the Canadian dollars will generally be U.S. source ordinary income or loss to a U.S. Holder.

The Company generally does not pay any dividends and does not anticipate paying any dividends in the foreseeable future.

Sale, Exchange or Other Taxable Disposition of Common Shares

Subject to the PFIC rules discussed above, upon a sale, exchange or other taxable disposition of Common Shares, a U.S. Holder generally will recognize capital gain or loss for U.S. federal income tax purposes equal to the difference, if any, between the amount realized on the sale, exchange or other taxable disposition and the U.S. Holder’s adjusted tax basis in the Common Shares.

This capital gain or loss will be long-term capital gain or loss if the U.S. Holder’s holding period in the Common Shares exceeds one year. The deductibility of capital losses is subject to limitations. Any gain or loss will generally be U.S. source for U.S. foreign tax credit purposes.

Information Reporting and Backup Withholding

Payments made within the U.S., or by a U.S. payor or U.S. middleman, of dividends on, and proceeds arising from sales or other dispositions of Common Shares, generally will be reported to the IRS and to the U.S. Holder as required under applicable regulations. Backup withholding tax may apply to these payments if the U.S. Holder fails to timely provide in the appropriate manner an accurate taxpayer identification number or otherwise fails to comply with, or establish an exemption from, such backup withholding tax requirements. Certain U.S. Holders are not subject to the information reporting or backup withholding tax requirements described herein. U.S. Holders should consult their tax advisors as to their qualification for exemption from backup withholding tax and the procedure for establishing an exemption.

Backup withholding tax is not an additional tax. U.S. Holders generally will be allowed a refund or credit against their U.S. federal income tax liability for amounts withheld, provided the required information is timely furnished to the IRS. The company assumes responsibility for the withholding of tax at the source.

Subject to certain exceptions and future guidance, a U.S. Holder that is a “specified individual” or a “specified domestic entity” (as defined in the instructions to IRS Form 8938) must report annually to the IRS on IRS Form 8938 such U.S. Holder’s interests in stock or securities issued by a non-U.S. person (such as the Company). U.S. Holders should consult their tax advisors regarding the information reporting obligations that may arise from their acquisition, ownership or disposition of Common Shares.

F. Dividends and paying agents

Not required.

G. Statement by experts

Not required.

H. Documents on display

In addition to placing our audited consolidated annual financial statements before every annual meeting of shareholders as described above, we are subject to the information requirements of the Securities Exchange Act of 1934, as amended. In accordance with these requirements, we file and furnish reports and other information with the SEC. These materials, including this Annual Report on Form 20-F and the exhibits hereto, may be inspected and copied at the SEC’s Public Reference Room at 100 F Street, N.E., Room 1580, Washington, D.C. 20549. The public may obtain information on the operation of the SEC’s Public Reference Room by calling the SEC in the U.S. at 1-800-SEC-0330. 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. Our annual reports and some of the other information we submitted to the SEC may be accessed through this website. In addition, material we filed can be inspected on the Canadian Securities Administrators’ electronic filing system, SEDAR, accessible at the website www.sedar.com. This material includes our Management Information Circular for our annual meeting of shareholders to be held in 2023 to be furnished to the SEC on Form 6-K, which provides information including directors’ and officers’ remuneration and indebtedness and principal holders of securities. Additional financial

information is provided in our audited annual financial statements for the year ended December 31, 2022 and our MD&A relating to these statements included elsewhere in this Annual Report on Form 20-F. These documents are also accessible on SEDAR (www.sedar.com) and on EDGAR (www.sec.gov).

I. Subsidiary information

Not required.

Item 11. Quantitative and Qualitative Disclosures About Market Risk

Fair value

The Company classifies its financial instruments in the following categories: “Financial assets at amortized cost”; and “Financial liabilities at amortized cost”.

- The Company’s financial assets at amortized cost are comprised of cash and cash equivalents, trade and other receivables and restricted cash equivalents.
- Financial liabilities at amortized cost include payables and accrued liabilities, and lease liability.

The carrying values of all of the aforementioned financial instruments approximate their fair values due to their short-term maturity or to the prevailing interest rates of these instruments which are comparable to those of the market.

The Black-Scholes valuation methodology uses inputs in calculating fair value, as defined in IFRS 13, which establishes a hierarchy that prioritizes the inputs used to measure fair value. The hierarchy gives the highest priority to unadjusted quoted prices in active markets for identical assets or liabilities (Level 1 measurement) and the lowest priority to unobservable inputs (Level 3 measurement).

Financial risk factors

The following provides disclosures relating to the nature and extent of the Company’s exposure to risks arising from financial instruments, including credit risk, liquidity risk and foreign exchange risk and how the Company manages those risks.

(a) Credit risk

Credit risk is the risk of an unexpected loss if a customer or counterparty to a financial instrument fails to meet its contractual obligations. The Company regularly monitors credit risk exposure and takes steps to mitigate the likelihood of this exposure resulting in losses. The Company’s exposure to credit risk currently relates to the financial assets at amortized cost in the table above. The Company holds its available cash in amounts that are readily convertible to known amounts of cash and deposits its cash balances with financial institutions that have an investment grade rating of at least “P-2” or the equivalent. This information is supplied by independent rating agencies where available and, if not available, the Company uses publicly available financial information to ensure that it invests its cash in creditworthy and reputable financial institutions. Once there are indicators that there is no reasonable expectation of recovery, such financial assets are written off but are still subject to enforcement activity.

As of December 31, 2022, three counterparties included in trade accounts receivable comprised a total receivable of approximately \$403 (2021 - \$932) of which \$nil (2021 - \$55) was past due, considered to be impaired and fully provided for.

Generally, the Company does not require collateral or other security from customers for trade accounts receivable; however, credit is extended following an evaluation of creditworthiness. In addition, the Company performs ongoing credit reviews of all of its customers and determines expected credit losses. On this basis, as of December 31, 2022, the Company has provided for all outstanding and unpaid amounts relating to its operations.

The maximum exposure to credit risk approximates the amount recognized in the Company’s consolidated statement of financial position.

(b) Liquidity risk

Liquidity risk is the risk that the Company will not be able to meet its financial obligations as they become due. The Company manages this risk through the management of its capital structure by monitoring rolling forecasts of the Company’s cash and cash equivalents on the basis of expected cash flows.

Management concluded that the Company has sufficient cash on hand to meet its obligations as they become due for the next 12 months, considering the Company’s planned research and development activities, selling expenses, general and administrative expenses and working capital requirements. The Company has the ability to scale its research and development activities, and will do so as necessary, based on cash availability. While the Company has \$50,611 in cash and cash equivalents at December 31, 2022, it continues to have an ongoing need for additional capital resources to research and develop, commercialize and manufacture its products and technologies.

All of the Company’s financial liabilities except lease liabilities are current liabilities with expected settlement dates within one year.

(c) Foreign exchange risk

Entities using the Euro as their functional currency

The Company is exposed to foreign exchange risk due to its investments in foreign operations whose functional currency is the Euro.

As of December 31, 2022, if the US dollar had increased or decreased by 10% against the Euro, with all other variables held constant, net loss for the year ended December 31, 2022 would have been lower or higher by approximately \$823 (2021 - \$300 and 2020 - \$110).

Item 12. Description of Securities Other than Equity Securities

A. Debt securities

Not required.

B. Warrants and rights

Not required.

C. Other securities

Not required.

D. American depositary shares

Not applicable.

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PART II

Item 13. Defaults, Dividend Arrearages and Delinquencies

None.

Item 14. Material Modifications to the Rights of Security Holders and Use of Proceeds

None.

Item 15. Controls and Procedures

Under the supervision and with the participation of our management, including the Chief Executive Officer and the Chief Financial Officer, we have evaluated the effectiveness of our disclosure controls and procedures as of December 31, 2022. Our disclosure controls and procedures are designed to ensure that information required to be disclosed in the reports we file or submit under the Securities Exchange Act of 1934 is recorded, processed, summarized and reported within the time periods specified in the Securities and Exchange Commission's rules and forms, and that such information is accumulated and communicated to our management, including the Chief Executive Officer and the Chief Financial Officer, to allow timely decisions regarding required disclosures.

Any controls and procedures, no matter how well designed and operated, can provide only reasonable assurance of achieving the desired control objective and management necessarily applies its judgment in evaluating the cost-benefit relationship of possible controls and procedures. Based on this evaluation, the Chief Executive Officer and Chief Financial Officer have concluded that these disclosure controls and procedures were effective as of December 31, 2022.

Management's Annual Report on Internal Control over Financial Reporting

Our management is responsible for establishing and maintaining adequate internal control over financial reporting. Our internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with IFRS as issued by the IASB.

Our internal control over financial reporting includes those policies and procedures that: (i) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of Aeterna Zentaris; (ii) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with IFRS, and that receipts and expenditures of the Company are being made only in accordance with authorizations of Company management; and (iii) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use or disposition of Company assets that could have a material effect on the financial statements.

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

Remediation of material weakness

As disclosed in Item 15 - "Controls and Procedures" in our Annual Report on Form 20-F for the year ended December 31, 2021 and in each of our quarterly MD&As filed during 2022, management identified a control deficiency that constitutes a material weakness. A material weakness is a control deficiency, or a combination of control deficiencies in internal control over financial reporting, such that there is a reasonable possibility that a material misstatement of our interim or annual consolidated financial statements or related disclosures will not be prevented or detected on a timely basis.

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The material weakness resulted from a failure in the design and implementation of review controls over the accounting for license and collaboration agreements under IFRS and the related revenue recognition. Specifically, our review control was not sufficiently designed to adequately review and assess an accounting analysis for revenue recognition for complex revenue arrangements. This resulted in a restatement of our previously issued condensed interim consolidated financial statements as of and for the quarters and year-to-date periods ended March 31, 2021, June 30, 2021 and September 30, 2021, with respect to revenue recognition on one agreement. As a result, Management determined that a material weakness existed as described above.

During 2022, we executed our remediation plan to address the material weakness discussed above and to improve our internal control over financial reporting. Our remediation activities included:

- strengthening our revenue recognition and financial reporting controls by adding new or additional resources with adequate technical knowledge and training, including the hiring of a new Chief Financial Officer in January 2022, a new corporate controller in September 2022, and utilizing the services of an external professional with requisite knowledge and experience in the area of revenue recognition and of IFRS more broadly.
- designing and implementing effective internal controls related to the involvement of appropriate finance and accounting staff in the review of strategic and complex transactions, such as license and collaboration agreements, including as those transactions are negotiated and executed, to ensure that any matters with accounting ramifications are addressed on a timely basis; and
- ensuring that all non-routine transactions, including those requiring the application of significant judgment or analysis, are thoroughly researched at the appropriate level and are sufficiently documented by qualified accounting and finance personnel (including third-party subject matter experts as necessary), with such documentation to be approved in a timely manner by the Company's Chief Financial Officer.

We tested such newly established policies, procedures, and control activities designed to address the above-described material weakness. As a result, we believe that this material weakness was remediated as of December 31, 2022.

Changes in Internal Controls over Financial Reporting

Other than completion of the actions taken to remediate the material weakness discussed above, there were no changes in our internal control over financial reporting during the year ended December 31, 2022 that materially affected, or are reasonably likely to materially affect, our internal control over financial reporting

Our management assessed our internal control over financial reporting as of December 31, 2022, the end the period covered by this Annual Report on Form 20-F. Management based its assessment on criteria established in "Internal Control—Integrated Framework (2013)" issued by the Committee of Sponsoring Organizations of the Treadway Commission. Based on management's assessment of our internal control over financial reporting, management concluded that, as of December 31, 2022, our internal control over financial reporting was effective.

Item 16A. Audit Committee Financial Expert

Our Board has determined that we have at least one audit committee financial expert (as defined in paragraph (b) of Item 16A to Form 20-F). The name of the audit committee financial expert is Mr. Dennis Turpin, the Audit Committee's Chairman. In accordance with Item 16A, paragraph (d) of Form 20-F, the designation of Mr. Turpin as our audit committee financial expert does not: (i) make Mr. Turpin an "expert" for any purpose, including without limitation for purposes of Section 11 of the Securities Act of 1933, as amended, as a result of this designation; (ii) impose any duties, obligations or liability on Mr. Turpin that are greater than those imposed on him as a member of the Audit Committee and the Board in the absence of such designation; or (iii) affect the duties, obligations or liability of any other member of the Audit Committee or the Board. The other current members of the Audit Committee are Peter G. Edwards and Gilles Gagnon each of whom, along with Dennis Turpin (Chair), is independent, as that term is defined in the NASDAQ listing standards. For a description of their respective education and experience, please refer to "Item 6. – Directors, Senior Management and Employees".

Item 16B. Code of Ethics

On December 16, 2017, the Board adopted a "Code of Conduct and Business Ethics", which replaced the then existing Code of Ethical Conduct as of January 1, 2018. The Code of Conduct and Business Ethics was amended on January 24, 2018. The Code of Conduct and Business Ethics expanded on the previous Code of Ethical Conduct to provide additional details of expected conduct of all employees and directors of the Company, including specific obligations the Company and its employees has as a member of the healthcare industry. We selected an independent third party supplier to provide a confidential and anonymous communication channel for reporting concerns about possible violations to our Code of Ethical Conduct as well as financial and/or accounting irregularities or fraud. A copy of the Code of Ethical Conduct, as amended, is incorporated by reference as Exhibit 11.1 to this Annual Report on Form 20-F and is also available on our Web site at www.zentaris.com under the Investors - Corporate Governance tab. The Code of Ethical Conduct is a "code of ethics" as defined in paragraph (b) of Item 16B to Form 20-F. The Code of Ethical Conduct applies to all of our employees, directors and officers, including our principal executive officer, principal financial officer, and principal accounting officer or controller, or persons performing similar functions, and includes specific provisions dealing with integrity in accounting matters, conflicts of interest and compliance with applicable laws and regulations. On December 4, 2014, our Board adopted a "Code of Business Conduct and Ethics for Members of the Board of Directors", which is incorporated by reference as Exhibit 11.2 to this Annual Report on Form 20-F. We will provide these documents without charge to any person or company upon request to our Corporate Secretary, at our head office at 315 Sigma Drive, Summerville, South Carolina 29486.

Item 16C. Principal Accountant Fees and Services

(All amounts are in U.S. dollars)

The current auditors of the Company are Ernst & Young LLP. Ernst & Young LLP was appointed as the Company's auditor effective March 25, 2021.

(a) Audit Fees

During the financial year ended December 31, 2022, the Company's principal accountant, Ernst & Young LLP, billed \$390,571 for the audit of the Company's annual consolidated financial statements and for services rendered in connection with statutory and regulatory filings. During the financial year ended December 31, 2021, the Company's principal accountant, Ernst & Young LLP, billed \$242,986, for the audit of the Company's annual consolidated financial statements and for services rendered in connection with statutory and regulatory filings.

(b) Audit-related Fees

During the financial year ended December 31, 2022, the Company's principal accountant, Ernst & Young LLP, billed \$nil, for audit or attest services not required by statute or regulation, for accounting consultations on proposed transactions, for the review of prospectuses and prospectus supplements, including the delivery of customary consent and comfort letters in connection therewith. During the financial year ended December 31, 2021, the Company's principal accountant, Ernst & Young LLP, billed \$nil, for audit or attest services not required by statute or regulation, for accounting consultations on proposed transactions, for the review of prospectuses and prospectus supplements, including the delivery of customary consent and comfort letters in connection therewith.

(c) Tax Fees

During the financial year ended December 31, 2022, the Company's principal accountants, Ernst & Young LLP, billed \$15,646, for services related to tax compliance, tax planning and tax advice. During the financial years ended December 31, 2021, the Company's principal accountants, Ernst & Young LLP, billed \$45,054, for services related to tax compliance, tax planning and tax advice.

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(d) All Other Fees

During the financial years ended December 31, 2022, the Company's principal accountant, Ernst & Young LLP, billed us \$Nil for services not included in audit fees, audit-related fees and tax fees. During the financial years ended December 31, 2021, the Company's principal accountant, Ernst & Young LLP, billed us \$3,987 for services not included in audit fees, audit-related fees and tax fees.

(e) Audit Committee Pre-Approval Policies and Procedures

Under applicable Canadian securities regulations, we are required to disclose whether our Audit Committee has adopted specific policies and procedures for the engagement of non-audit services and to prepare a summary of these policies and procedures. The Audit Committee Charter (incorporated by reference as Exhibit 11.3 to this Annual Report on Form 20-F) provides that it is such committee's responsibility to approve all audit engagement fees and terms as well as reviewing policies for the provision of non-audit services by the external auditors and, when required, the framework for pre-approval of such services. The Audit Committee delegates to its Chairman the pre-approval of such non-audit fees. The pre-approval by the Chairman is then presented to the Audit Committee at its first scheduled meeting following such pre-approval.

For each of the years ended December 31, 2022 and 2021, there were no non-audit services provided by our external auditor that required the approval from the Audit Committee.

Item 16D. Exemptions from the Listing Standards for Audit Committees

None.

Item 16E. Purchases of Equity Securities by the Issuer and Affiliated Purchasers

None.

Item 16F. Change in Registrant's Certifying Accountant

Following a comprehensive review of the Company's external audit services, the Audit Committee sought proposals to provide audit services for the financial year ending on December 31, 2022. Following a comprehensive review of the Company's external audit services, the Audit Committee sought proposals to provide audit services for the financial year ending on December 31, 2021. After careful review of the proposals received and due consideration of all relevant factors, the Audit Committee recommended to the Board that Ernst & Young LLP, and not PricewaterhouseCoopers LLP, be proposed for appointment as auditors of the Company for the financial year ending on December 31, 2021. Ernst & Young LLP was appointed as the Company's auditor and PricewaterhouseCoopers LLP resigned as the Company's auditor effective March 25, 2021.

In the past two years the independent auditor's reports have not contained an adverse opinion or a disclaimer of opinion, or was qualified or modified as to uncertainty, audit scope, or accounting principles.

Item 16G. Corporate Governance

We are generally in compliance with the corporate governance requirements of the NASDAQ except as described below and in the risk factor entitled “Our Common Shares may be delisted from the NASDAQ or the TSX, which could affect their market price and liquidity. If our Common Shares were to be delisted, investors may have difficulty in disposing their Common Shares” in Item 3.D above. We are not in compliance with the NASDAQ requirement that a quorum for a meeting of the holders of our Common Shares be no less than 33 1/3% of such outstanding shares. Our bylaws provide that a quorum for purposes of any meeting of our shareholders consists of at least 10% of the outstanding voting shares. We benefit from an exemption from the NASDAQ from this quorum requirement because the quorum provided for in our bylaws complies with the requirements of the CBCA, our governing corporate statute, and with the rules of the TSX, the home country exchange on which our voting shares are traded. In accordance with applicable current NASDAQ requirements, we have in the past, and upon request, provided to the NASDAQ letters from outside counsel certifying that these practices are not prohibited by our home country law.

Item 16H. Mine Safety Disclosure

None.

Item 16I. Disclosure Regarding Foreign Jurisdictions that Prevent Inspections

Not applicable.

PART III

Item 17 Financial Statements

The financial statements appear on pages [108] to [155].

Item 18. Financial Statements

Not applicable.

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Aeterna Zentaris Inc.

Consolidated Financial Statements

As of December 31, 2022 and 2021 and for the years ended December 31, 2022, 2021 and 2020

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Report of Independent Registered Public Accounting Firm

To the Shareholders and the Board of Directors of

Aeterna Zentaris Inc.

Opinion on the Financial Statements

We have audited the accompanying consolidated statements of financial position of **Aeterna Zentaris Inc.** (the Company) as of December 31, 2022 and 2021, the related consolidated statements of changes in shareholders' equity, loss and comprehensive loss, and cash flows, for each of the two years in the period ended December 31, 2022, and the related notes (collectively referred to as the “consolidated financial statements”). In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of the Company as of December 31, 2022 and 2021, and its financial performance and its cash flows for each of the two years in the period ended December 31, 2022, in conformity with International Financial Reporting Standards (IFRSs) as issued by the International Accounting Standards Board.

Basis for Opinion

These financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on the Company's financial statements based on our audits. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) (PCAOB) and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement, whether due to error or

fraud. The Company is not required to have, nor were we engaged to perform, an audit of its internal control over financial reporting. As part of our audits, we are required to obtain an understanding of internal control over financial reporting but not for the purpose of expressing an opinion on the effectiveness of the Company's internal control over financial reporting. Accordingly, we express no such opinion.

Our audits included performing procedures to assess the risks of material misstatement of the financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. We believe that our audits provide a reasonable basis for our opinion.

Critical Audit Matter

The critical audit matter communicated below is a matter arising from the current period audit of the financial statements that was communicated or required to be communicated to the audit committee and that: (1) relates to accounts or disclosures that are material to the financial statements and (2) involved our especially challenging, subjective, or complex judgments. The communication of the critical audit matter does not alter in any way our opinion on the consolidated financial statements, taken as a whole, and we are not, by communicating the critical audit matter below, providing a separate opinion on the critical audit matter or on the account or disclosure to which it relates.

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Goodwill impairment

Description of the matter

As disclosed in notes 2, 3 and 11 of the consolidated financial statements, the Company tests goodwill for impairment at least annually, or if there is an indication that the group of CGUs to which goodwill has been allocated may be impaired. Impairment is determined by assessing whether the carrying value of the group of CGUs, including the allocated goodwill, exceeds its recoverable amount, which is determined based on the higher of fair value less costs of disposal ("FVLCD") and value in use ("VIU"). For the year ended December 31, 2022, the Company recorded an impairment charge on its goodwill for an amount of \$7.6 million. Management determined the recoverable amount of the group of CGUs based on a FVLCD model which was determined to be higher than VIU. FVLCD was determined based on a market approach and derived from market data, including information from market participants regarding the price that the Company could receive in a sale of the group of CGUs. VIU was determined using cash flow projections covering a five-year period and discounted to their present value using an estimated pre-tax discount rate.

We identified the impairment of goodwill for the group of CGUs as a critical audit matter because of the significant judgments made by management to determine the appropriate methodology and assumptions made to estimate the recoverable amount of the group of CGUs.

How we addressed the matter in our audit

To test the estimated recoverable amount for the goodwill impairment test, our audit procedures included, among others, obtaining the analysis prepared by management and, with the assistance of our valuation specialists, assessing the methodology used by management for developing the recoverable amount estimate. We compared the estimated FVLCD to supporting documentation and available market data, including, information from market participants regarding the price that the Company could receive in a sale of the group of CGUs. We also obtained management's VIU model and assessed the reasonableness of management's estimates and assumptions related to cash flow projections by comparing to historical data, current agreements and market information. With the assistance of our valuation specialists, we tested the discount rate by developing a range of independent estimates and compared those to the discount rate selected by management.

/s/ Ernst & Young LLP

We have served as the Company's auditor since 2021.
Montreal, Canada
March 22, 2023

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Report of Independent Registered Public Accounting Firm

To the Board of Directors and Shareholders of Aeterna Zentaris Inc.

Opinion on the Financial Statements

We have audited the accompanying consolidated statements of changes in shareholders' equity, loss and comprehensive loss and cash flows for the year ended December 31, 2020, including the related notes (collectively referred to as the consolidated financial statements). In our opinion, the consolidated financial statements present fairly, in all material respects, the results of the Company's

operations and its cash flows for the year ended December 31, 2020 in conformity International Financial Reporting Standards as issued by the International Accounting Standards Board.

Basis for Opinion

These consolidated financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on the Company's consolidated financial statements based on our audit. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) (PCAOB) and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audit of these consolidated financial statements in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud. The Company is not required to have, nor were we engaged to perform, an audit of its internal control over financial reporting. As part of our audit we are required to obtain an understanding of internal control over financial reporting but not for the purpose of expressing an opinion on the effectiveness of the Company's internal control over financial reporting. Accordingly, we express no such opinion.

Our audit included performing procedures to assess the risks of material misstatement of the consolidated financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the consolidated financial statements. Our audit also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. We believe that our audit provides a reasonable basis for our opinion.

/s/ PricewaterhouseCoopers LLP

Chartered Professional Accountants, Licensed Public Accountants

Toronto, Canada

March 24, 2021

Except for adjustments to reflect the reverse stock split as described in note 16, for which the date is March 22, 2023.

We have served as the Company's auditor from 1993 to 2021.

PricewaterhouseCoopers LLP

PwC Tower, 18 York Street, Suite 2600, Toronto, Ontario, Canada M5J 0B2

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"PwC" refers to PricewaterhouseCoopers LLP, an Ontario limited liability partnership.

Aeterna Zentaris Inc.

Consolidated Statements of Financial Position

As of December 31, 2022 and 2021

(in thousands of US dollars)

	2022	2021
	\$	\$
ASSETS		
Current assets		
Cash and cash equivalents (note 6)	50,611	65,300
Trade and other receivables (note 7)	732	1,314
Inventory	229	73
Income taxes receivable	1,428	2,361
Prepaid expenses and other current assets (note 8)	2,488	1,772
Total current assets	55,488	70,820
Non-current assets		
Restricted cash equivalents (note 6)	322	335
Property and equipment (note 9)	216	192
Identifiable intangible assets (note 10)	—	625
Goodwill (note 11)	—	8,130
Total non-current assets	538	9,282
Total assets	56,026	80,102
LIABILITIES		
Current liabilities		
Payables and accrued liabilities (note 12)	3,828	2,672
Provisions (note 13)	45	34
Income taxes payable (note 22)	108	115
Deferred revenues (note 5)	2,949	4,815
Lease liabilities (note 14)	114	130

Total current liabilities	7,044	7,766
Non-current liabilities		
Deferred revenues (note 5)	1,684	1,493
Deferred gain (note 10)	110	98
Lease liabilities (note 14)	65	31
Employee future benefits (note 15)	11,159	17,485
Provisions (note 13)	188	243
Total non-current liabilities	13,206	19,350
Total liabilities	20,250	27,116
Shareholders' equity		
Share capital (note 16)	293,410	293,410
Warrants (note 17)	5,085	5,085
Other capital (note 18)	90,332	89,788
Deficit	(352,084)	(334,619)
Accumulated other comprehensive loss	(967)	(678)
Total Shareholders' equity	35,776	52,986
Total liabilities and shareholders' equity	56,026	80,102

Commitments (note 27)

Subsequent event (note 28)

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

Approved by the Board of Directors

/s/ Carolyn Egbert

Carolyn Egbert
Chair of the Board

/s/ Dennis Turpin

Dennis Turpin
Director

Aeterna Zentaris Inc.

Consolidated Statements of Changes in Shareholders' Equity

For the years ended December 31, 2022, 2021 and 2020

(in thousands of US dollars)

	Share capital \$	Warrants \$	Other capital \$	Deficit \$	Accumulated other comprehensive income (loss) \$	Total \$
Balance - January 1, 2020	224,528	—	89,806	(316,891)	94	(2,463)
Net loss	—	—	—	(5,118)	—	(5,118)
Other comprehensive loss:						
Foreign currency translation adjustments	—	—	—	—	(1,139)	(1,139)
Actuarial loss on defined benefit plans and remeasurement of the net defined benefit liability (note 15)	—	—	—	(650)	—	(650)
Comprehensive loss	—	—	—	(5,768)	(1,139)	(6,907)
Reclassification of warrants to equity (note 17)	—	7,377	—	—	—	7,377
Issuance of common shares and warrants, net of transaction costs (note 16)	10,480	5,025	(362)	—	—	15,143
Share-based compensation costs	—	—	61	—	—	61
Balance - December 31, 2020	235,008	12,402	89,505	(322,659)	(1,045)	13,211
Net loss	—	—	—	(8,368)	—	(8,368)
Other comprehensive loss:						
Foreign currency translation adjustments	—	—	—	—	367	367
Actuarial loss on defined benefit plans and remeasurement of the net defined benefit liability (note 15)	—	—	—	(3,592)	—	(3,592)
Comprehensive loss	—	—	—	(11,960)	367	(11,593)
Issuance of common shares and warrants, net of transaction costs (note 16)	29,082	1,897	—	—	—	30,979
Exercise of warrants (note 17)	29,833	(9,746)	—	—	—	20,087
Transfer of warrant issuance costs upon exercise of warrants (note 17)	(532)	532	—	—	—	—
Exercise of deferred share units	19	—	(28)	—	—	(9)
Share-based compensation costs	—	—	311	—	—	311
Balance - December 31, 2021	293,410	5,085	89,788	(334,619)	(678)	52,986
Net loss	—	—	—	(22,727)	—	(22,727)

Other comprehensive loss:						
Foreign currency translation adjustments	—	—	—	—	(289)	(289)
Actuarial gain on defined benefit plans and remeasurement of the net defined benefit liability (note 15)	—	—	—	5,262	—	5,262
Comprehensive loss	—	—	—	(17,465)	(289)	(17,754)
Share-based compensation costs	—	—	544	—	—	544
Balance - December 31, 2022	<u>293,410</u>	<u>5,085</u>	<u>90,332</u>	<u>(352,084)</u>	<u>(967)</u>	<u>35,776</u>

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

Aeterna Zentaris Inc.

Consolidated Statements of Loss and Comprehensive Loss

For the years ended December 31, 2022, 2021 and 2020

(in thousands of US dollars, except share and per share data)

	Years ended December 31,		
	2022	2021	2020
	\$	\$	\$
Revenues (notes 5 and 25)	5,640	5,260	3,652
Expenses (note 19)			
Cost of sales	157	90	2,317
Research and development	12,506	6,574	1,506
Selling, general and administrative	8,230	7,267	5,893
Gain on modification of building lease	—	—	(219)
Impairment of intangible assets (note 10)	584	—	—
Impairment of goodwill (note 11)	7,642	—	—
(Reversal of) impairment of other assets (note 7)	124	—	(139)
Total operating expenses	29,243	13,931	9,358
Loss from operations	(23,603)	(8,671)	(5,706)
Gains due to changes in foreign currency exchange rates	879	215	572
Change in fair value of warrant liability (note 17)	—	—	1,147
Other finance costs	(3)	(21)	(736)
Net finance income	876	194	983
Loss before income taxes	(22,727)	(8,477)	(4,723)
Income tax recovery (expense) (note 22)	—	109	(395)
Net loss	(22,727)	(8,368)	(5,118)
Other comprehensive loss:			
Items that may be reclassified subsequently to profit or loss:			
Foreign currency translation adjustments	(289)	367	(1,139)
Items that will not be reclassified to profit or loss:			
Actuarial gain (loss) on defined benefit plans and remeasurement of the net defined benefit liability	5,262	(3,592)	(650)
Comprehensive loss	(17,754)	(11,593)	(6,907)
Basic and diluted loss per share (note 26)	(4.68)	(1.82)	(3.11)
Weighted average number of shares outstanding (basic and diluted)	4,855,876	4,596,980	1,643,327

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

Aeterna Zentaris Inc.

Consolidated Statements of Cash Flows

For the years ended December 31, 2022, 2021 and 2020

(in thousands of US dollars)

Years ended December 31,

	2022	2021	2020
	\$	\$	\$
Cash flows from operating activities			
Net loss	(22,727)	(8,368)	(5,118)
Items not affecting cash and cash equivalents:			
Amortization of deferred revenues	(1,704)	(1,670)	1,257
Share-based compensation costs	544	311	61
Provision for restructuring and other costs	(28)	23	(383)
Impairment of intangible assets (note 10)	584	—	—
Impairment of goodwill (note 11)	7,642	—	—
(Reversal of) impairment of other assets	124	—	(139)
Depreciation and amortization	135	145	232
Employee future benefits	295	161	217
Gain on modification of building lease	—	—	(219)
Change in fair value of warrant liability	—	—	(1,147)
Transaction costs of warrants issued, expensed as finance cost	—	—	732
Gain on disposal of property and equipment	—	(1)	(2)
Interest accretion on lease liabilities	4	7	(19)
Net foreign exchange differences	16	(179)	(688)
Other non-cash items	-	95	133
Refund (Payment) of income taxes	831	(1,605)	(1,448)
Changes in operating assets and liabilities (note 21)	604	2,500	2,402
Net cash used in operating activities	(13,680)	(8,581)	(4,129)
Cash flows from financing activities			
Proceeds from issuances of common shares and warrants (note 16)	—	34,200	23,500
Transaction costs	—	(3,221)	(2,767)
Proceeds from exercise of warrants and deferred share units	—	20,087	—
Proceeds on deferred gain	16	98	—
Payments on lease liabilities	(134)	(127)	(265)
Net cash (used in) provided by financing activities	(118)	51,037	20,468
Cash flows from investing activities			
Purchase of intangible assets	—	(609)	—
Purchase of property and equipment	(11)	(30)	—
Proceeds for disposals of property and equipment	—	1	6
(Decrease) increase in restricted cash equivalents	(1)	(20)	50
Net cash (used in) provided by investing activities	(12)	(658)	56
Effect of exchange rate changes on cash and cash equivalents	(879)	(769)	38
Net change in cash and cash equivalents	(14,689)	41,029	16,433
Cash and cash equivalents - beginning of year	65,300	24,271	7,838
Cash and cash equivalents - end of year	50,611	65,300	24,271

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

Aeterna Zentaris Inc.

Notes to Consolidated Financial Statements

As of December 31, 2022 and December 31, 2021 and for the years ended

December 31, 2022, 2021 and 2020

(in thousands of US dollars, except share and per share data and where otherwise noted)

1. Business overview

Summary of business

Aeterna Zentaris (the “Company” or “Aeterna”) is a specialty biopharmaceutical company commercializing and developing therapeutics and diagnostic tests. The Company’s lead product, Macrilen™ (macimorelin), is the first and only U.S. Food and Drug Administration (“FDA”) and European Medicines Agency-approved oral test indicated for the diagnosis of patients with adult growth hormone deficiency (“AGHD”). Macrilen™ is currently marketed in the US through a license agreement (the “Novo Amendment”) between the Company and Novo Nordisk Health Care AG (“Novo”) until May 2023 and in the United Kingdom and Europe through a license agreement with Consilient Healthcare Inc (“Consilient” or “CH”) under the trade name of Ghryvelin®. The Company is also dedicated to the development of therapeutic assets and has recently taken steps to establish a pre-clinical pipeline to potentially address unmet medical needs across several indications with a focus on rare or orphan indications with the potential for pediatric use.

Impact of COVID-19 and the Russian invasion of Ukraine

The impact of the COVID-19 variants and the Russian invasion of Ukraine continue to cause delays in site initiation and patient enrollment in our DETECT-trial and may be impacting sales activities for Macrilen™ in the US and for Ghryvelin® in Europe. As a result of these delays in our DETECT-trial, the DETECT-trial will now continue until later into 2023, as compared to the end of the 2022 year as anticipated at the end of the previous fiscal year. The delays associated with COVID-19 and the Russian invasion of Ukraine have resulted in additional costs to the program and an increase in the estimated costs to complete the DETECT-trial. The Company will continue to monitor the impact of the COVID-19 pandemic and the Russian invasion of Ukraine in future periods and assess the impact of these on its judgments, estimates, accounting policies and amounts recognized in the consolidated financial statements. Actual results could differ from these estimates, and such differences may be material.

Reporting entity

The accompanying consolidated financial statements include the accounts of Aeterna Zentaris Inc., an entity incorporated under the *Canada Business Corporations Act*, and its wholly owned subsidiaries (the “Group”). Aeterna Zentaris Inc. is the ultimate parent company of the Group. The Company currently has three wholly owned direct and indirect subsidiaries, Aeterna Zentaris GmbH (“AEZS Germany”), based in Frankfurt, Germany, Zentaris IVF GmbH, a wholly owned subsidiary of AEZS Germany, based in Frankfurt, Germany, and Aeterna Zentaris, Inc., an entity incorporated in the state of Delaware and with offices in Summerville, South Carolina, in the US.

The registered office of the Company is located at 222 Bay Street, Suite 3000, P.O. Box 53, Toronto, Ontario M5K 1E7, Canada.

The Company’s common shares are listed on both the Toronto Stock Exchange and on the NASDAQ Capital Market.

Basis of presentation

(a) Statement of compliance

These consolidated financial statements as of December 31, 2022 and 2021 and for the years ended December 31, 2022, 2021 and 2020 have been prepared in accordance with International Financial Reporting Standards as issued by the International Accounting Standards Board (“IFRS”).

Aeterna Zentaris Inc.

Notes to Consolidated Financial Statements

As of December 31, 2022 and December 31, 2021 and for the years ended December 31, 2022, 2021 and 2020

(in thousands of US dollars, except share and per share data and where otherwise noted)

These consolidated financial statements were approved by the Company’s Board of Directors on March 22, 2023.

The preparation of financial statements in accordance with IFRS requires the use of certain critical accounting estimates and the exercise of management’s judgment in applying the Company’s accounting policies. Areas involving a high degree of judgment or complexity and areas where assumptions and estimates are significant to the Company’s consolidated financial statements are discussed in note 3 - Critical accounting estimates and judgments.

(b) Basis of measurement

The consolidated financial statements have been prepared under a historical cost convention.

(c) Principles of consolidation

These consolidated financial statements include any entity in which the Company directly or indirectly holds more than 50% of the voting rights or over which the Company exercises control. The Company controls an entity when the Company is exposed to, or has rights to, variable returns from its involvement with the entity and has the ability to affect those returns through its power over the entity. An entity is included in the consolidation from the date that control is transferred to the Company, while any entities that are sold are excluded from the consolidation from the date that control ceases. All inter-company balances and transactions are eliminated on consolidation.

(d) Foreign currency

Items included in the financial statements of the Group’s entities are measured using the currency of the primary economic environment in which the entities operate (the “functional currency”), which is the US dollar for the Company and its US subsidiary, Aeterna Zentaris, Inc., and the Euro (“EUR” or “€”) for its German subsidiaries.

Assets and liabilities of the German subsidiaries are translated from EUR balances at the period-end exchange rates, and the results of operations are translated from EUR amounts at average rates of exchange for the period. The resulting translation adjustments are included in accumulated other comprehensive loss within shareholders’ equity.

Foreign currency transactions are translated into the functional currency using the exchange rates prevailing at the dates of the underlying transaction. Foreign exchange gains and losses resulting from the settlement of such transactions and from the translation of monetary assets and liabilities not denominated in the functional currency are recognized in the consolidated statements of loss and comprehensive loss.

2. Summary of significant accounting policies

The accounting policies set out below have been applied consistently to all years presented in these consolidated financial statements and have been applied consistently by all Group entities.

Cash and cash equivalents

Cash and cash equivalents consist of unrestricted cash on hand and balances with banks, as well as short-term interest-bearing deposits, such as money market accounts, that are readily convertible to known amounts of cash and are subject to an insignificant risk of changes in value, with a maturity of three months or less from the date of acquisition.

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Aeterna Zentaris Inc.

Notes to Consolidated Financial Statements

As of December 31, 2022 and December 31, 2021 and for the years ended

December 31, 2022, 2021 and 2020

(in thousands of US dollars, except share and per share data and where otherwise noted)

Inventory

Inventory is valued at the lower of cost or net realizable value. Cost is determined using the first-in, first-out method. The Company's policy is to write down inventory that has become obsolete and inventory that has a cost basis in excess of its expected net realizable value. Increases in the reserve are recorded as charges in cost of sales. For product candidates that have not been approved by the FDA, inventory used in clinical trials is written down at the time of production and recorded as research and development ("R&D") costs. For products that have been approved by the FDA, inventory used in clinical trials is expensed at the time the inventory is packaged for the clinical trial. All direct manufacturing costs incurred after approval are capitalized into inventory. As of December 31, 2022 and 2021, all inventory related to work in process.

Restricted cash equivalents

Restricted cash equivalents are comprised of bank deposits, which are related to a guarantee for a long-term operating lease obligation, and for corporate credit card programs that cannot be used for current purposes.

Property and equipment

Items of property and equipment are recorded at cost, net of accumulated depreciation and impairment charges. Depreciation is calculated using the following methods, annual rates and period:

	Methods	Annual rates and period
Equipment	Declining balance and straight-line	20%
Computer equipment	Straight-line	25% to 33 ¹ /3%

Depreciation expense, which is recorded in the consolidated statement of loss and comprehensive loss, is allocated to the appropriate functional expense categories to which the underlying items of property and equipment relate.

Right of use assets are measured at cost, which comprises the initial lease liability, lease payments made at or before the lease commencement date, initial direct costs and restoration obligations, less lease incentives. Right of use assets are subsequently measured at amortized cost. The assets are depreciated over the shorter of the assets' useful life and the lease terms on a straight-line basis, less any accumulated impairment losses, and adjusted for any remeasurement of the lease liability. The lease term includes periods covered by an option to extend if the Company is reasonably certain to exercise that option.

Identifiable intangible assets

Identifiable intangible assets with finite useful lives consist of in-process R&D acquired in business combinations, patents, trademarks, in-licensed technology and rights to serialization equipment located at the Company's third-party manufacturing manufacturer. In-process R&D acquired in business combinations is recognized at fair value at the acquisition date. Patents and trademarks are comprised of costs, including professional fees incurred in connection with the filing of patents and the registration of trademarks for product marketing and manufacturing purposes, net of related government grants, impairment losses and accumulated amortization. Identifiable intangible assets with finite useful lives are amortized beginning at the time at which the assets are available for use, on a straight-line basis over the assets' estimated useful lives, which range from seven to fifteen years for in-process R&D and patents and are ten years for trademarks. Amortization expense, which is recorded in the consolidated statement of loss and comprehensive loss, is allocated to the appropriate functional expense categories to which the underlying identifiable intangible assets relate.

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Aeterna Zentaris Inc.

Notes to Consolidated Financial Statements

As of December 31, 2022 and December 31, 2021 and for the years ended

December 31, 2022, 2021 and 2020

(in thousands of US dollars, except share and per share data and where otherwise noted)

Contingent payments

The Company accounts for contingent variable payments for separately acquired intangible assets, such as in-licensed technology, under the cost accumulation approach. Contingent consideration is not considered on initial recognition of the asset but instead is added to the cost of the asset initially recorded when incurred.

Goodwill

Goodwill is recognized as the fair value of the consideration transferred, including the recognized amount of any non-controlling interest in the acquiree, less the fair value of the net identifiable assets acquired, and liabilities assumed, as of the acquisition date. Subsequent to initial recognition, goodwill is measured at cost less accumulated impairment losses. Goodwill acquired in business combinations is allocated to groups of cash generating units ("CGU") that are expected to benefit from the synergies of the combination.

Impairment of long-lived assets

Items of property and equipment and identifiable intangible assets with finite lives that are subject to depreciation or amortization, respectively, are reviewed for impairment whenever events or changes in circumstances indicate that the carrying amounts of the assets may not be recoverable. Intangible assets that are not subject to amortization are tested when there are indications that their carrying value may not be recoverable, or, at a minimum, annually. Management is required to assess at each reporting date whether there is any indication that an asset may be impaired. Where such an indication exists, the asset's recoverable amount is compared to its carrying value, and an impairment loss is recognized for the amount by which the asset's carrying amount exceeds its recoverable amount. The recoverable amount is the higher of an asset's fair value less costs to sell and value in use. For purposes of assessing impairment, assets are grouped at the lowest levels for which there are separately identifiable cash flows, or CGU. In determining value in use of a given asset or CGU, estimated future cash flows are discounted to their present value using a pre-tax discount rate that reflects current market assessments of the time value of money and the risks specific to the asset.

Items of property and equipment and identifiable intangible assets with finite lives that have suffered impairment are reviewed for possible reversal of the impairment if there has been a change, since the date of the most recent impairment test, in the estimates used to determine the impaired asset's recoverable amount. However, an asset's carrying amount, increased due to the reversal of a prior impairment loss, must not exceed the carrying amount that would have been determined, net of depreciation or amortization, had the original impairment not occurred.

Goodwill is not subject to amortization, but instead is tested for impairment annually or more often if there is an indication that the group of CGUs to which the goodwill has been allocated may be impaired. Impairment is determined for goodwill by assessing whether the carrying value of the group of CGUs, including the allocated goodwill, exceeds the group of CGU's recoverable amount, which is the higher of fair value less costs of disposal and the group of CGU's value in use. Fair value less costs of disposal is determined based on a market approach and also derived from market data, including, information from market participants regarding the price that the Company could receive in a sale of the group of CGUs. Value in use is determined based on cash flow projections from financial budgets approved by senior management covering a five-year period. The estimated future cash flows are discounted to their present value using a pre-tax discount rate that reflects current market assessments of the time value of money and the risks specific to the group of CGUs. In the event that the carrying amount of the group of CGU's, including the allocated goodwill exceeds its recoverable amount, an impairment loss is recognized in an amount equal to the excess. Impairment losses related to goodwill, which are recorded in the consolidated statement of loss and comprehensive loss, are not subsequently reversed.

Provisions

Provisions represent liabilities to the Company for which the amount or timing is uncertain. Provisions are recognized when the Company has a present legal or constructive obligation as a result of past events when it is probable that an outflow of resources will be required to settle the obligation and where the amount can be reliably estimated. Provisions are not recognized for future operating losses.

Aeterna Zentaris Inc.

Notes to Consolidated Financial Statements

As of December 31, 2022 and December 31, 2021 and for the years ended

December 31, 2022, 2021 and 2020

(in thousands of US dollars, except share and per share data and where otherwise noted)

Provisions are made for any contracts which are deemed onerous. A contract is onerous if the unavoidable costs of meeting the obligations under the contract exceed the economic benefits expected to be received under it. Provisions for onerous contracts are measured at the present value of the lower of the expected cost of terminating the contract and the expected net cost of continuing with the contract. Present value is determined based on expected future cash flows that are discounted at a pre-tax rate that reflects current market assessments of the time value of money and the risks specific to the liability. The unwinding of the discount is recognized in finance costs.

Leases

At the inception of a contract, the Company assesses whether a contract is or contains a lease. A lease is a contract in which the right to control the use of an identified asset is granted for an agreed-upon period of time in exchange for consideration. The Company assesses whether a contract conveys the right to control the use of an identified asset when there is both the right to direct the use of the asset and obtain substantially all the economic benefits from that use. The Company recognizes a right of use

asset and a lease liability at the lease commencement date.

The lease liability is initially measured at the present value of the non-cancellable lease payments over the lease term and discounted at the rate implicit in the lease. If that rate cannot be determined, the Company's incremental borrowing rate, or the rate that Company would have to pay to borrow the funds necessary to obtain an asset of similar value in a similar economic environment with similar terms and conditions, is used. Lease payments include fixed payments and such variable payments that depend on an index or a rate less any lease incentives receivable.

The lease liability is subsequently measured at amortized cost using the effective interest method and is remeasured when there is a change in future lease payments arising from a change in an index or rate, if there is a change in the Company's estimate of the amount expected to be payable under a residual value guarantee or if the Company changes its assessment of whether it will exercise a purchase, extension or termination option. When the lease liability is remeasured, a corresponding adjustment is made to the carrying amount of the right of use asset, with any difference recorded in the statement of loss and comprehensive loss.

The Company accounts for a lease modification as a separate lease if both of the following conditions exist: (a) the modification increases the scope of the lease by adding the right to use one or more underlying assets; and (b) the consideration for the lease increases by an amount equivalent to the standalone price for the increase in scope and any appropriate adjustments to that stand-alone price to reflect the circumstances of the particular contract. Where the Company accounts for a lease modification as a new lease, the separate lease is accounted for in the same way as a new lease, as described above.

Where the Company does not account for a lease modification as a separate lease, the lease liability is remeasured by: (a) decreasing the carrying amount of the right of use asset to reflect the partial or full termination of the lease for lease modifications that decrease the scope of the lease, with any gain or loss relating to the partial or full termination of the lease recorded in the consolidated statement of loss and comprehensive loss; or (b) making a corresponding adjustment to the right of use asset for all other lease modifications.

Payments associated with short-term leases and leases of low-value assets are recognized on a straight-line basis as an expense in the consolidated statement of loss and comprehensive loss.

Post-employment benefits

The Company has partially funded and unfunded defined benefit multi-employer pension plans, namely the DUPK pension plan and the RUK 1990 and 2006 pension plans, (the "Pension Benefit Plans") and unfunded post-employment benefit plans in Germany. Provisions for pension obligations are established for benefits payable in the form of retirement, disability and surviving dependent pensions. The Company also provides defined contribution plans to some of its employees.

Aeterna Zentaris Inc.

Notes to Consolidated Financial Statements

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For defined benefit pension plans and other post-employment benefits, net periodic pension expense is actuarially determined on a quarterly basis using the projected unit credit method. The cost of pension and other benefits earned by employees is determined by applying certain assumptions, including discount rates, rate of pension benefit increases, the projected age of employees upon retirement and the expected rate of future compensation.

The employee future benefits liability is recognized at its present value, which is determined by discounting the estimated future cash outflows using interest rates of high-quality corporate bonds that are denominated in the currency in which the benefits will be paid and that have terms to maturity approximating the terms of the related future benefit liability. Actuarial gains and losses that arise in calculating the present value of the defined benefit obligation are recognized in other comprehensive loss, net of tax, and simultaneously reclassified in the deficit in the consolidated statement of financial position in the year in which the actuarial gains and losses arise and without recycling to the consolidated statement of loss and comprehensive loss in subsequent periods.

For defined contribution plans, expenses are recorded in the consolidated statement of loss and comprehensive loss as incurred—namely, over the period that the related employee service is rendered.

Financial instruments

The Company classifies its financial instruments in the following categories: financial assets at fair value through profit or loss ("FVTPL"); financial liabilities at FVTPL; financial assets at amortized cost; financial liabilities at amortized cost and financial assets at fair value through other comprehensive income ("FVTOCI").

Financial assets at FVTPL

Financial assets carried at FVTPL are initially recorded at fair value, and transaction costs directly attributable to issuing the financial assets are expensed in the statement of loss and comprehensive loss. Realized and unrealized gains and losses arising from changes in the fair value of the financial assets held at FVTPL are included in the statement of loss and comprehensive loss in the period in which they arise. As of December 31, 2022 and 2021, the Company did not have any financial assets at FVTPL.

Financial liabilities at FVTPL

These financial liabilities are initially recognized at fair value, and transaction costs directly attributable to issuing the financial

liabilities are expensed in the statement of loss and comprehensive loss. Financial liabilities that are required to be measured at FVTPL are re-measured at each reporting date, with changes in fair value reported in the statement of loss and comprehensive loss. As of December 31, 2022 and 2021, the Company did not have any financial liabilities at FVTPL.

Financial assets at amortized cost

A financial asset is measured at amortized cost if the objective of the business model is to hold the financial asset for the collection of contractual cash flows, and the asset's contractual cash flows are comprised solely of payments of principal and interest. Financial assets at amortized cost are classified as current or non-current based on their maturity date and are initially recognized at fair value and subsequently carried at amortized cost, less any impairment.

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Financial liabilities at amortized cost

Financial liabilities classified as amortized cost are initially recognized at fair value, less directly attributable transaction costs. After initial recognition, costs are subsequently measured at amortized cost using the effective interest rate method with interest expense recognized on an effective yield basis. The effective interest rate is the rate that discounts estimated future cash payments through the expected life of the financial liability, or, where appropriate, a shorter period. Interest accretion is recorded in interest expense in the consolidated statement of loss and comprehensive loss.

Financial assets at FVTOCI

Investments in equity instruments at FVTOCI are initially recognized at fair value, plus incremental transaction costs. Subsequently, financial assets at FVTOCI are measured at fair value, with gains and losses arising from changes in fair value recognized in other comprehensive loss in the period in which those gains or losses arise. As of December 31, 2022 and 2021, the Company did not have any financial assets at FVTOCI.

Impairment of financial assets at amortized cost

The Company applies the simplified approach on trade receivables, which allows for the use of a lifetime expected credit loss ("ECL") provision considering the probability of default over the expected life of the financial asset. The 12-month ECL only considers default events that are possible within the year following the reporting date. The Company uses a provision matrix to calculate ECLs for trade receivables. The provision matrix is initially based on the Company's historical observed default rates and is subsequently evaluated and updated based on new and forward-looking information.

Share capital

Common shares are classified as equity. Incremental costs that are directly attributable to the issuance of common shares are recognized as a deduction from equity, net of any tax effects.

Share-based compensation costs

The Company operates an equity-settled share-based compensation plan under which the Company receives services from directors, senior executives, employees and other collaborators as consideration for equity instruments of the Company. The Company accounts for all forms of share-based compensation using the fair value-based method. Fair value of stock options is determined at the date of grant using the Black-Scholes option pricing model, which includes estimates of the number of awards that are expected to vest over the vesting period. Where granted share options vest in installments over the vesting period (defined as graded vesting), the Company treats each installment as a separate share option grant. Share-based compensation expense is recognized over the vesting period, or as specified vesting conditions are satisfied, and credited to other capital. Any consideration received by the Company in connection with the exercise of stock options is credited to share capital. Any other capital component of the share-based compensation is transferred to share capital upon the issuance of shares.

The Company grants deferred share units ("DSUs") to members of its Board of Directors who are not employees or officers of the Company. DSUs cannot be redeemed until the holder is no longer a director of the Company and are considered equity-settled instruments. Under the terms of the DSU agreement, the DSUs vest immediately upon grant. The value attributable to the DSUs is based on the market value of the share price at the time of grant and share based compensation expense is recognized in general and administrative expenses in the consolidated statement of loss and comprehensive loss. At the time of redemption, each DSU may be exchanged for one common share of the Company, net of applicable holding taxes. Any consideration received by the Company in connection with the exercise of DSUs is credited to share capital. Any other capital component of the share-based compensation is transferred to share capital upon the issuance of shares.

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Revenue recognition

The Company generates revenue from license and collaboration agreements with customers (license fees, milestone revenue, royalties), the provision of development services, the sale of certain active pharmaceutical ingredients ("API"), semi-finished goods and finished goods, and from certain supply chain activities, which are comprised largely of oversight or supervisory support services related to stability studies or development activities carried out with respect to API batch production as specified in underlying contracts with customers.

The Company applies the provisions of IFRS 15, *Revenue from Contracts with Customers* ("IFRS 15"), a single, comprehensive set of criteria for revenue recognition. IFRS 15 applies to all contracts with customers except for contracts that are within the scope of other standards. IFRS 15 prescribes a five-step framework through which revenue is recognized when control of promised goods or services is transferred to a customer at an amount that reflects the consideration to which the entity expects to be entitled in exchange for those goods or services. Goods and services that are determined not to be distinct are combined with other promised goods or services until a distinct bundle is identified. The Company allocates the transaction price (the amount of consideration to which the Company expects to be entitled in exchange for the promised goods or services) to each performance obligation and recognizes the associated revenue when (or as) each performance obligation is satisfied. The Company's estimate of the transaction price for each contract includes all variable consideration to which the Company expects to be entitled, and that estimate is reassessed at the end of each reporting period. When two or more contracts are entered into with the same customer at or near the same time, the Company evaluates the contracts to determine whether the contracts should be accounted for as a single arrangement.

The transaction price is allocated among the performance obligations on a relative standalone selling price basis, and the applicable revenue recognition criteria are applied to each of the separate performance obligations. Standalone selling prices may be estimated via methods that include, but are not limited to, an adjusted market assessment approach, an expected cost-plus-margin approach or a residual approach. Determining the standalone selling price for performance obligations requires significant judgment.

The Company applies judgment in determining whether a combined performance obligation is satisfied at a point in time or over time, and, for performance obligations satisfied over time, in concluding upon the appropriate method of measuring progress to be applied for purposes of recognizing revenue. The Company evaluates the measure of progress each reporting period and, as estimates related to the measure of progress change, related revenue recognition is adjusted accordingly. Changes in the Company's estimated measure of progress are accounted for on a cumulative catch-up basis as a change in accounting estimate and are recorded in the consolidated statement of loss and comprehensive loss in the period of adjustment.

License fees

If the license to the Company's intellectual property is determined to be distinct from the other promises or performance obligations identified in the arrangement, the Company recognizes revenue from non-refundable, upfront fees allocated to the license when the license is transferred to the customer and the customer is able to use and benefit from the license. In assessing whether a license is distinct from the other promises, the Company considers whether the collaboration partner can benefit from the license for its intended purpose without the receipt of the remaining promises, whether the value of the license is dependent on the unsatisfied promises, whether there are other vendors that could provide the remaining promises and whether it is separately identifiable from the remaining promises. For licenses that are combined with other promises, the Company utilizes judgment to assess the nature of the combined performance obligation and whether the license is the predominant promise within the combined performance obligation to determine whether the combined performance obligation is satisfied over time or at a point in time and, if over time, the appropriate method of measuring progress for purposes of recognizing revenue.

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Development services

Arrangements that include a promise for the Company to provide development services are assessed to determine whether the services are capable of being distinct, are not highly interdependent or do not significantly modify one another, and if so, the services are accounted for as a separate performance obligation as the services are provided to the customer. Otherwise, when development services are determined not to be capable of being distinct, such services are added to the performance obligation that includes the underlying license. For development services that are combined with other promises, the Company applies judgment to assess the nature of the combined performance obligation to determine whether the combined performance obligation is satisfied over time or at a point in time. The Company utilizes judgment to determine the appropriate method of measuring progress for purposes of recognizing revenue, which is generally an input measure such as costs incurred.

Milestone payments

At the inception of any contracts with a customer that includes milestone payments, which are oftentimes payable upon the successful achievement of development or regulatory events, the Company evaluates whether the milestones are considered probable of being reached and estimates the amount to be included in the transaction price using the most likely amount method. If the Company concludes it is highly probable that a significant revenue reversal will not occur, the associated milestone payment

is included in the transaction price. Milestone payments that are not within the control of the Company or the licensee, such as regulatory approvals, are generally not considered probable of being achieved until those approvals are received. The transaction price is then allocated to each performance obligation on a relative stand-alone selling price basis, for which the Company recognizes revenue when (or as) the performance obligations under the contract are satisfied. At the end of each subsequent reporting period, the Company reassesses the probability of achievement of milestones and any related constraints, and, if necessary, adjusts the estimate of the overall transaction price on a cumulative catch-up basis.

Royalty payments

For arrangements that include sales-based royalties, including milestone payments based on the level of sales, and when the license is deemed to be the predominant item to which the royalties relate, the Company recognizes revenue at the later of (a) when the related sales occur, or (b) when the performance obligation to which some or all of the royalty has been allocated has been satisfied or partially satisfied.

Product sales

The Company recognizes revenue from the sale of certain API and semi-finished goods, including MacrilenTM, upon delivery of such items to its customer.

Supply chain revenue

Supply chain services are contracted with fixed fees and are provided over a period of time. The Company recognizes revenue on a straight-line basis over time as it best represents the pattern of performance of the services.

While providing services, the Company incurs certain direct costs for subcontractors and other expenses that are recoverable directly from its customers. The recoverable amounts of these direct costs are included in the Company's operating expenses as the Company controls the services before they are transferred to the customer and acts as a principal in these arrangements.

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Contract costs

The Company recognizes as an asset the incremental costs of obtaining a contract with a customer if the costs are expected to be recovered, and any capitalized contract costs are amortized on a systematic basis that is consistent with the transfer to the customer of the goods or services to which the asset relates. As a practical expedient, the Company recognizes the incremental costs of obtaining a contract as an expense when incurred if the amortization period of the asset that it otherwise would have recognized is one year or less. To date, the Company has not incurred any incremental costs of obtaining a contract with a customer.

Contract modifications

Contract modifications are defined in IFRS 15 as changes in the scope or price (or both) of a contract that are approved by the parties to the contract, such as a contract amendment. Contract modifications exist when the parties to a contract approve a modification that either creates new or changes existing enforceable rights and obligations of the parties to the contract. Depending on facts and circumstances, the Company accounts for a contract modification in one of the following ways: (a) as a separate contract; (b) as a termination of the existing contract and a creation of a new contract; or (c) as a combination of the preceding treatments. A contract modification is accounted for as a separate contract if the scope of the contract increases because of the addition of promised goods or services that are distinct and the price of the contract increases by an amount of consideration that reflects the Company's standalone selling prices of the additional promised goods or services. When a contract modification is not considered a separate contract and the remaining goods or services are distinct from the goods or services transferred on or before the date of the contract modification, the Company accounts for the contract modification as a termination of the existing contract and a creation of a new contract. When a contract modification is not considered a separate contract and the remaining goods or services are not distinct, the Company accounts for the contract modification as an add-on to the existing contract and as an adjustment to revenue on a cumulative catch-up basis.

Income tax

Income tax on profit or loss comprises current and deferred tax. Tax is recognized in profit or loss, except that a change attributable to an item of income or expense recognized as other comprehensive loss or directly in equity is also recognized directly in other comprehensive loss or directly in equity. Management periodically evaluates positions taken in tax returns with respect to situations in which applicable tax regulation is subject to interpretation and establishes provisions where appropriate on the basis of amounts expected to be paid to the tax authorities.

The current income tax charge is calculated in accordance with tax rates and laws that have been enacted or substantively enacted by the reporting date in the countries where the Company's subsidiaries operate and generate taxable income.

Deferred income tax is recognized on temporary differences (other than, where applicable, temporary differences associated with unremitted earnings from foreign subsidiaries and associates, to the extent that the investment is essentially permanent in duration, and temporary differences associated with the initial recognition of goodwill) arising between the tax bases of assets and liabilities and their carrying amounts in the consolidated financial statements and on unused tax losses or R&D non-refundable

tax credits in the Group. Deferred income tax is determined using tax rates and laws that have been enacted or substantively enacted by the reporting date.

Deferred income tax assets are recognized only to the extent that it is probable that future taxable profit will be available against which the temporary differences can be utilized.

Deferred income tax assets and liabilities are offset when there is a legally enforceable right to offset current tax assets against current tax liabilities and when the deferred income taxes assets and liabilities relate to income taxes levied by the same taxation authority on either the same taxable entity or different taxable entities where there is an intention to settle the balances on a net basis.

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The Company provides reserves for potential payments of tax to various tax authorities related to uncertain tax positions and other issues. Reserves are based on a determination of whether and how much of a tax benefit taken by the Company in its tax filing is more likely than not to be realized following resolution of any potential contingencies present related to the tax benefit.

Government assistance

Amounts received or receivable resulting from government assistance programs, including grants and refundable investment tax credits for research and development, are accounted for in accordance with IAS 20, *Accounting for Government Grants and Disclosure of Government Assistance*, and are recognized where there is reasonable assurance that the amount of government assistance will be received, and all attached conditions will be complied with. When the amount relates to an expense item such as research and development costs, it is recognized as income on a systematic basis as a reduction to the costs that it is intended to compensate. When the grant relates to an asset, it reduces the carrying amount of the asset and is then recognized as income over the useful life of the depreciable asset by way of a reduced depreciation charge.

Research and development expenses

Research costs are expensed as incurred. Development costs are expensed as incurred, except for those that meet the criteria for deferral, in which case the costs are capitalized and amortized to operations over the estimated period of benefit. No development costs have been capitalized during any of the periods presented.

Net loss per share

Basic net loss per share is calculated using the weighted average number of common shares outstanding during the year.

Diluted net loss per share is calculated based on the weighted average number of common shares outstanding during the year, plus the effects of dilutive common share equivalents, such as stock options, warrants and similar instruments. The number of shares included with respect to options, warrants and similar instruments is computed using the treasury stock method. Diluted net loss per share is equal to the basic net loss per share as the Company is in a loss position and all securities, comprised of options and warrants, would be anti-dilutive.

3. Critical accounting estimates and judgments

The preparation of consolidated financial statements in accordance with IFRS requires management to make judgments, estimates and assumptions that affect the reported amounts of the Company's assets, liabilities, revenues, expenses and related disclosures. Judgments, estimates and assumptions are based on historical experience, expectations, current trends and other factors that management believes to be relevant at the time at which the Company's consolidated financial statements are prepared.

Management reviews, on a regular basis, the Company's accounting policies, assumptions, estimates and judgments in order to ensure that the consolidated financial statements are presented fairly and in accordance with IFRS. Revisions to accounting estimates are recognized in the period in which the estimates are revised and in any future periods affected.

Critical accounting estimates and assumptions are those that have a significant risk of causing material adjustment and are often applied to matters or outcomes that are inherently uncertain and subject to change. As such, management cautions that future events often vary from forecasts and expectations and that estimates routinely require adjustment.

The following discusses the most significant accounting estimates and assumptions that the Company has made in the preparation of the consolidated financial statements.

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Accounting for a contract modifications

The Novo Amendment as well as the Novo notice of termination of the Novo Amendment received on August 26, 2022, as defined and discussed in note 5 – License, supply and distribution arrangements, and which were determined to be modifications pursuant to the provisions of IFRS 15, required management to apply significant judgments, including: assessment of any changes to the scope of the license agreement; assessment of whether the remaining goods or services are distinct from goods or services transferred before the modifications; and assessment as to whether a portion of the changes in the transaction price was attributable to the amount of variable consideration promised before the modifications. Any changes in the judgments or assumptions applied to account for this agreement could have a significant impact on the Company's revenue and deferred revenue.

License and collaboration arrangements with multiple elements

The Company enters into licensing and supply agreements related to the licensing, development, supply and distribution for macimorelin in various territories. Each agreement may contain specific terms or clauses that require careful analysis by management under IFRS 15 in order to ensure the appropriate accounting treatment is reached. The agreements may include non-refundable upfront payments and licensing fees, the provision of development services, pre- and post-commercialization milestone payments, royalties on future product sales derived from such license agreements, and supply arrangements. Management analyzes each agreement and applies significant judgment to determine whether contracts entered into at or near the same time should be accounted for as a single arrangement, whether all parts of the contract are scoped within IFRS 15, to identify all performance obligations, determine whether a performance obligation is distinct or should be combined with other promised goods and services, determine and allocate the transaction price on a relative stand-alone selling price basis, determine whether a combined performance obligation is satisfied at a point in time or over time, and, for performance obligations satisfied over time, in concluding upon the appropriate method of measuring progress to be applied for purposes of recognizing revenue. Any changes in the judgments or assumptions applied can give rise to a significant impact on the Company's revenues and deferred revenues.

Impairment of goodwill

The annual impairment assessment related to goodwill requires management to estimate the recoverable amount, which is the higher of an asset's fair value less costs of disposal and value in use. Management has determined that using fair value less cost of disposal results in the higher estimated recoverable value. The carrying amount of its consolidated net assets is compared to the fair value less cost of disposal. Based on this calculation, management determined that goodwill was impaired (see note 11).

Employee future benefits

The determination of expenses and obligations associated with employee future benefits requires the use of assumptions, such as the discount rate to measure obligations, rate of pension benefit increases, the projected age of employees upon retirement and the expected rate of future compensation. Because the determination of the costs and obligations associated with employee future benefits requires the use of various assumptions, there is measurement uncertainty inherent in the actuarial valuation process. Actual results will differ from results that are estimated based on the aforementioned assumptions. Additional information is included in note 15 - Employee future benefits.

Research and development accruals

As part of the process of preparing our financial statements, management is required to estimate accrued expenses including those pertaining to the Company's research and development expenses. This process involves reviewing open contracts and purchase orders, communicating with our personnel to identify services that have been performed on the Company's behalf and estimating the level of service performed and the associated cost incurred for the service when the Company has not yet been invoiced or otherwise notified of the actual cost. If the actual timing of the performance of services or the level of effort varies from management's estimate, the Company adjusts the accrued or prepaid expense balance accordingly. Although the Company does not expect estimates to be materially different from amounts actually incurred, if those estimates of the status and timing of services performed differ from the actual status and timing of services performed, the Company may report amounts that are too high or too low in any particular period.

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4. Recent accounting pronouncements

New standards and interpretations not yet adopted

Certain new accounting standards, amendments to accounting standards and interpretations have been published that are not mandatory for 31 December 2022 reporting periods and have not been early adopted by the Company. These standards, amendments or interpretations are not expected to have a material impact on the entity in the current or future reporting periods and on foreseeable future transactions.

5. Revenue

Disaggregation of revenue

The Company derives revenue from the transfer of goods and services over time and at a point in time in the following categories:

	Years ended December 31,		
	2022	2021	2020
	\$	\$	\$
License fees	1,704	1,670	911
Development services	3,617	3,337	—
Product sales	57	—	2,370
Royalties	101	68	67
Supply chain	161	185	304
	5,640	5,260	3,652

Revenues of approximately \$5,555 (2021 - \$5,260 and 2020 - \$3,634) are derived from Novo Nordisk.

License, supply and distribution arrangements

Novo Nordisk Health Care AG - Macrilen™ - United States and Canada

On January 16, 2018, the Company entered into a License 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, which provides for (i) a right to use license relating to the adult indication (the “Adult Indication”); (ii) a license for a future FDA-approved pediatric indication (the “Pediatric Indication”); (iii) the licensee to fund 70% of the costs of a pediatric clinical trial (the “DETECT-trial”) submitted for approval to the EMA and FDA to be run by the Company with oversight from a joint steering committee (the “PIP”); and (iv) for an Interim Supply Arrangement. In January 2018, the Company received a cash payment of \$24,000 from Strongbridge and on July 23, 2018, Strongbridge launched product sales of Macrilen™ (macimorelin) in the U.S. The Company is also entitled to receive a milestone payment of \$5,000 upon FDA approval of the Pediatric Indication. Effective December 19, 2018, Strongbridge sold the entity which owned the License Agreement for the U.S. and Canadian rights to Macrilen™ (macimorelin) to Novo. In 2020, the Interim Supply Arrangement was concluded and Novo contracted the Company to provide supply chain services for the manufacture of Macrilen™ (macimorelin).

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On November 16, 2020, the Company entered into an amendment (the “Novo Amendment”) of its existing License Agreement with Novo related to the development and commercialization of macimorelin.

Under the Novo Amendment, Aeterna continues to retain all rights to macimorelin outside of the U.S. and Canada but Novo agreed to make an upfront payment to Aeterna of \$6,109 (€5,000), which the Company received in December 2020. Under the Novo Amendment, the royalty payment Aeterna receives on sales in the U.S. and Canada was reduced from 15% to 8.5% for annual net sales up to \$40,000 and returns to 15% or more for annual net sales of macimorelin over \$40,000. Additionally, the \$5,000 variable payment owing to Aeterna by Novo, upon FDA approval of the pediatric indication, was waived. Under the Novo Amendment, Novo and Aeterna agreed that solely Aeterna will conduct the pivotal DETECT-trial in partnership with a contract research organization (“CRO”). Given the transfer of development activities to Aeterna, the percentage of DETECT-trial costs that Novo is required to reimburse to Aeterna was adjusted from 70% to 100% of costs up to €9,000 (approximately \$10,980). Any additional external jointly approved DETECT-trial costs incurred over €9,000 will be shared equally between Novo and Aeterna. In addition, certain changes to rights and responsibilities of the joint steering committee were made.

Under the amended terms, Novo was also granted co-ownership of the U.S. and Canadian patents and trademarks owned by Aeterna on macimorelin but will be required to transfer co-ownership in those patents back to Aeterna on the occurrence of certain termination events.

Management has determined that the modification that grants co-ownership of the U.S. and Canadian patents and trademarks that were previously licensed by the Company to Novo is not a distinct performance obligation as the related benefits are highly interdependent and interrelated with the licensed indications granted under the existing license contract prior to the modification.

In addition, upon regulatory approval of macimorelin in the U.S. for the diagnosis of CGHD, if Novo determines not to commercialize macimorelin in Canada, then Aeterna has the option to exclusively license rights to macimorelin in Canada (but not in U.S.) to a third party. The Novo Amendment also confirms that Aeterna has the right to use the results from the DETECT-trial, if successful, to support Aeterna seeking regulatory approval and ongoing efforts to seek partnering opportunities for macimorelin in other regions outside of the two countries licensed to Novo, the U.S. and Canada.

Analysis prior to modification

At contract inception, upon analysis of the total discounted cash flows of both the \$24,000 payment and the \$5,000 payment upon FDA approval of the Pediatric Indication, the Company determined that 84% of the future revenue streams would be derived from

the Adult Indication and 16% from the Pediatric Indication. On a relative fair value basis, the Company had allocated the transaction price to the performance obligations resulting in \$23,600 being allocated to the Adult Indication and being recognized as license fee revenue in the consolidated statement of loss and comprehensive loss for the year ended, December 31, 2018, and \$400 being allocated to the Pediatric Indication, which was recognized as deferred revenue on the consolidated statement of financial position and amortized on a straight-line basis beginning January 2018, over a period of 5.4 years, into the consolidated statements of loss and comprehensive loss.

Under the License Agreement, the Company considered the funding arrangement under the PIP to be a collaboration arrangement under IFRS 11 and has accounted for the invoicing as a reduction of costs incurred. During 2020, the Company invoiced its licensee \$1,099 as its share of the costs incurred by the Company.

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Analysis post modification

On November 16, 2020, the Company announced that it had entered into the Novo Amendment of its existing License Agreement and received an upfront payment of \$6,109 (€5,000) in December 2020. Management determined that the remaining performance obligation under the contract which provides the customer with the license of a future FDA approved Pediatric Indication is a distinct performance obligation before and after the modification. Accordingly, the Company accounted for the modification to the License Agreement as an adjustment to the existing License Agreement with Novo, on a prospective basis. The portion of the changes in the transaction price that was attributable to the change in royalty rate was allocated to both the Adult Indication and the Pediatric Indication. Based on the change in future royalty rates, the Company determined that \$550 of the additional upfront payment should be allocated to the Adult Indication. Accordingly, the Company allocated \$550 (€470) to the Adult Indication which was recognized in revenues for the year ended December 31, 2020 and deferred \$5,559 (€4,530).

As required per IFRS 11, given changes in facts and circumstances with respect to the development activities associated with the pediatric indication—namely, the substantive changes to rights and responsibilities granted to Novo pursuant to the Novo Amendment—management reassessed whether the classification of those activities should change. Management concluded that the parties to the Novo Amendment no longer share joint control of the related activities. As such, the Pediatric Indication development activities are no longer accounted for under IFRS 11, and the incremental performance obligation associated with the Pediatric Indication development services has been combined with the pediatric license for revenue recognition purposes. No other additional performance obligations were identified in the Novo Amendment.

Based on the preceding analysis, management determined that the total modified transaction price was \$5,754 (€4.7 million), which is comprised of \$195 (€0.2 million) pre-Novo Amendment unamortized pediatric license fee and \$5,559 (€4.5 million) post-Novo Amendment Pediatric Indication and has been allocated to the remaining combined performance obligation. Revenue associated with this performance obligation is being recognized as pediatric development services using a cost-to-cost measure of progress method. The transfer of control to Novo occurs over time, and as such, in management's judgment, this input method is the best measure of progress towards satisfying the performance obligation and reflects a faithful depiction of the transfer of goods and services.

Notice of termination

On August 26, 2022, Novo provided the Company with a notice of termination of the Novo Amendment. Under the terms of the Novo Amendment, the termination is effective May 23, 2023 upon the completion of a 270 day notice period ("notice period"). Upon termination, the rights and licenses granted by the Company to Novo under the Novo Amendment will be returned to the Company, and the Company will regain full rights to continue the clinical development and future commercialization of Macrilen™. Following the notice of termination and throughout the 270 day notice period, as per the terms of the Novo Amendment, Novo will continue to fund all DETECT-trial costs up to \$9.6 million (€9 million), and any additional DETECT-trial costs incurred over \$9.6 million (€9 million) up to \$10.5 million (€9.8 million) will be shared equally between Novo and the Company.

The Company concluded that the notice of termination represents a contract modification for accounting purposes. The Company further concluded that upon receipt of the notice of termination, the remaining goods and services to be performed during the notice period are considered distinct goods and services and therefore, the contract modification is to be accounted for prospectively. As of the date of receipt of the notice of termination from Novo, the Company had recognized total license fees associated with the Pediatric Indication of \$1,615 (€1,880) and total development services revenue of \$3,865 (€4,448). Subsequent to the receipt of the notice of termination, management estimated the combined transaction price of the remaining services to be performed as \$7,937 (€7,776), comprised of Pediatric Indication license fees of \$2,872 (€2,814) and development services revenue of \$5,065 (€4,962). Revenue associated with this combined performance obligation will be recognized as pediatric development services are incurred during the notice period, until the date of termination on May 23, 2023, using the cost-to-cost method. As such, all amounts in deferred revenue are classified as current as of December 31, 2022 to reflect the revised timing. Management will continue to reevaluate the transaction price at the end of each reporting period.

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Supply Chain Arrangement

The Company agreed, in the Interim Supply Arrangement to the License Agreement, 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. The Company believes the stand-alone selling price of the manufacturing ingredients to be their cost, as that approximates the amount at which Novo would be able to procure those same goods with other suppliers. In November 2019, Novo contracted with AEZS Germany, to provide supply chain services including provision of supervision of stability studies (support services) as well as API batch production and delivery of certain API and semi-finished goods.

Consilient Healthcare Limited - Macimorelin - European Union and United Kingdom

On December 7, 2020, the Company entered into an exclusive licensing agreement with Consilient Health Limited ("CH") for the commercialization of macimorelin (the "Licensed Product") in the European Economic Area and the United Kingdom (the "CH License Agreement").

Under the terms of the CH License Agreement, CH agreed to make a non-refundable, non-creditable upfront payment to the Company of \$1,209 (€1.0 million), which the Company received in January 2021. The Company also is eligible to receive additional consideration, including regulatory milestones related to agreed-upon pricing and reimbursement parameters; net sales milestones; and royalties, ranging from 10%-20% of net sales of macimorelin, subject to reduction in certain cases, or sublicense income recorded by CH. Also on December 7, 2020, the Company and CH entered into an exclusive supply agreement, pursuant to which the Company agreed to provide the Licensed Product to CH, with such Licensed Product to be manufactured by third-party manufacturers for a period of ten years, subject to renewal (the "CH Supply Agreement").

The total transaction price associated with the CH Agreement is \$1,209 (€1.0 million), which consists of the non-refundable, non-creditable upfront payment, discussed above. At the inception of the contract, all other contractual consideration to which the Company may be entitled represents variable consideration, including the regulatory milestones, which were determined to be zero, based on management's estimate of the most likely amount, given that the achievement of the underlying milestones is uncertain and highly susceptible to factors outside of the Company's control.

The Company allocated the transaction price to the combined performance obligation of the license agreement and the supply agreement for the adult and pediatric indication, using the application of an adjusted market assessment approach. Revenue will be recognized over time using an outputs method based on units of Licensed Product supplied to CH. The total units that the Company expects to supply to CH pursuant to the CH Agreement is an estimate, based on current projections and anticipated market demand, and therefore will be a significant judgment that will be relied upon when using the outputs method to recognize revenue.

In December 2021, the Department of Health and Social Care in the United Kingdom approved a list price which triggered a \$226 (€0.2 million) pricing milestone payment, which was allocated to the Adult license performance obligation and deferred to the consolidated statement of financial position.

In May 2022, the list price was approved in Germany which triggered a \$213 (€0.2 million) pricing milestone payment. In December 2022, the list price was also approved in Spain which triggered a further \$106 (€0.1 million) pricing milestone payment. Both payments were allocated to the Adult license performance obligation and deferred to the consolidated statement of financial position.

The aggregate amount of the transaction price allocated to the Company's unsatisfied or partially unsatisfied performance obligations under the CH Agreement as of December 31, 2022 was \$1,591 (€1,483) and as of December 31, 2021 was \$1,358 (€1,200). The Company expects to recognize the balance of the relevant deferred revenue over the remaining period of nine years, subject to extension based on the outcome of the ongoing clinical development related to the Pediatric Indication and related patent application initiatives.

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For the year ended December 31, 2022, the Company recognized \$18 (2021 - \$nil) as license fee revenue associated with the CH Agreement.

NK Meditech Limited - Macimorelin - Korea

The Company and NK Meditech Limited ("NK") entered into a licensing agreement, effective November 30, 2021 and pursuant to which the Company granted to NK the exclusive right to commercialize (including marketing, selling and offering to sell) macimorelin in the Republic of Korea (the "ROK") and as applicable, in the Democratic People's Republic of Korea ("DPRK") to the extent NK is allowed to use the aforementioned licensed rights in the latter ("NK License Agreement").

Under the terms of the NK License Agreement, NK agreed to make a non-refundable, non-creditable upfront payment to the Company of \$136 (€0.1 million), which the Company received in December 2021. The Company also is eligible to receive

additional consideration, including a regulatory milestone related to the approval of macimorelin in the Pediatric Indication in the ROK and/or DPRK. Additionally, NK has agreed to pay AEZS royalties of 12% of any sublicense income (i.e., royalties, upfront payments, license or option fees, lump sum payments, equity securities, milestone payments or other non-cash consideration) that may be received by NK from any future sublicensees ("Sublicense Income").

Also, effective November 30, 2021, the Company and NK entered into an exclusive supply agreement, pursuant to which the Company agreed to provide macimorelin to NK for a period of ten years, subject to renewal (the "NK Supply Agreement").

Management determined that the total transaction price associated with the NK License Agreement was \$136 (€0.1 million), which consists of the upfront payment, discussed above, that was received by the Company in 2021. The Company allocated the \$136 (€0.1 million) transaction price to the single combined performance using an outputs method based on units of macimorelin supplied to NK over a 10-year period.

Liabilities related to contracts with customers

The Company has recognized the following deferred revenue balances related to contracts with customers:

	December 31, 2022		
	Current	Non-Current	Total
	\$	\$	\$
Novo Nordisk Health Care	2,914	—	2,914
Consilient Healthcare Limited	35	1,556	1,591
NK Meditech Limited	—	128	128
	<u>2,949</u>	<u>1,684</u>	<u>4,633</u>

	December 31, 2021		
	Current	Non-Current	Total
	\$	\$	\$
Novo Nordisk Health Care	4,791	23	4,814
Consilient Healthcare Limited	24	1,334	1,358
NK Meditech Limited	—	136	136
	<u>4,815</u>	<u>1,493</u>	<u>6,308</u>

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6. Cash and cash equivalents

	December 31,	
	2022	2021
	\$	\$
Cash on hand and balances with banks	50,611	55,600
Interest-bearing deposits with maturities of three months or less	—	9,700
	<u>50,611</u>	<u>65,300</u>

The Company had restricted cash equivalents amounting to \$322 at December 31, 2022 (2021 - \$335). These balances consist of certificates of deposit that are used as collateral for corporate credit cards and leases.

7. Trade and other receivables

	December 31,	
	2022	2021
	\$	\$
Trade accounts receivable	403	877
Value added tax	275	248
Other receivables	54	189
	<u>732</u>	<u>1,314</u>

During the year ended December 31, 2022, the Company recorded a write-down within other receivables of \$124 (2021 - \$nil).

8. Prepaid expenses and other current assets

	December 31,	
	2022	2021
	\$	\$
Prepaid insurance	428	421

Prepaid research and development	1,998	1,329
Other	62	22
	2,488	1,772

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9. Property and equipment

Components of the Company's property and equipment are summarized below.

	Cost				
	Equipment	Computer Equipment	Right of use building	Right of use vehicles	Total
	\$	\$	\$	\$	\$
At January 1, 2021	215	335	546	94	1,190
Additions	6	24	16	—	46
Modification of building lease	—	—	109	—	109
Disposals	(5)	(69)	—	—	(74)
Impact of foreign exchange rate changes	(17)	(22)	(48)	(7)	(94)
At December 31, 2021	199	268	623	87	1,177
Additions	—	11	—	38	49
Modification of lease	—	—	98	18	116
Disposals	—	(1)	(10)	—	(11)
Impact of foreign exchange rate changes	(11)	(13)	(26)	(7)	(57)
At December 31, 2022	188	265	685	136	1,274

	Accumulated Depreciation				
	Equipment	Computer Equipment	Right of use building	Right of use vehicles	Total
	\$	\$	\$	\$	\$
At January 1, 2021	199	329	437	46	1,011
Disposals	(5)	(69)	—	—	(74)
Depreciation	4	5	94	26	129
Impact of foreign exchange rate changes	(17)	(21)	(38)	(5)	(81)
At December 31, 2021	181	244	493	67	985
Disposals	—	(1)	(10)	—	(11)
Depreciation	2	9	94	25	130
Impact of foreign exchange rate changes	(10)	(12)	(21)	(3)	(46)
At December 31, 2022	173	240	556	89	1,058

	Carrying amount				
	Equipment	Computer Equipment	Right of use building	Right of use vehicles	Total
	\$	\$	\$	\$	\$
At December 31, 2021	18	24	130	20	192
At December 31, 2022	15	25	129	47	216

On September 30, 2022 the Company and its landlord mutually agreed to a one-year plus 6 months' notice extension to its existing building lease agreement for its German subsidiary, continuing such terms until March 31, 2024, resulting in a modification being recorded to the building right of use asset in the amount of \$98 (2021 - \$109).

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10. Identifiable intangible assets

Changes in the carrying value of the Company's identifiable intangible assets are summarized below.

	December 31, 2022			December 31, 2021		
	Cost	Accumulated amortization	Carrying value	Cost	Accumulated amortization	Carrying value
	\$	\$	\$	\$	\$	\$
Balances - Beginning of the year	32,411	(31,786)	625	35,020	(34,961)	59
Additions	—	—	—	609	—	609
Amortization	—	(5)	(5)	—	(16)	(16)
Impairment of intangible assets	(584)	—	(584)	—	—	—
Impact of foreign exchange rate changes	(2,055)	2,019	(36)	(3,218)	3,191	(27)
Balances - End of the year	29,772	(29,772)	—	32,411	(31,786)	625

In 2021, the Company recorded additions of \$609, for separately identified intangibles related to upfront payments under certain license agreements. These intangible assets were not subject to amortization in the years ended December 31, 2022 and 2021 as they are not ready for their intended use. Amortization of intangible assets with finite lives of \$5 (2021 - \$16 and 2020 - \$20) is presented in research and development expenses.

During the year ended December 31, 2022, the Company ceased its development of both the COVID-19 and Chlamydia vaccine trials. The previously capitalized upfront payments for licenses relating to these two trials of \$212 was fully impaired. Furthermore, as part of the Company's annual goodwill and intangible asset impairment assessment, the Company identified the need for an additional impairment of \$372 to intangible assets, as discussed in note 11.

Cetrotide

On August 10, 2021, the Company entered into a trademark maintenance and assignment option agreement with ARES Trading SA, a subsidiary of Merck KGaA ("Merck"), with respect to the trademarks owned by the Company on Cetrotide® (cetorelix acetate for injection), a luteinizing hormone-releasing hormone antagonist approved for therapeutic use as part of in vitro fertilization programs in women undergoing infertility treatment (the "Cetrotide Agreement"). The Company had transferred all Cetrotide activities to Merck in 2013 via a license and supply agreement ("LSA").

Pursuant to the Cetrotide Agreement, the Company has granted to Merck the exclusive option to acquire any and all rights in the Cetrotide trademarks at the end of the term of the LSA (the "Option"), which currently is May 2029 (the "Transfer Date"), when, as agreed, the Company will convey and assign to Merck all rights and interest in, as well as title to, the Cetrotide trademarks. The transfer of the trademarks on the Transfer Date shall constitute a sale, after which the Company will no longer have any ownership in or obligations related to the Cetrotide trademarks.

As consideration for having been granted the Option, Merck has agreed to pay the Company a total of \$566 (€0.5 million) a portion of which is to be calculated as a reimbursement of all internal and external trademark fees incurred by the Company for all years beginning with 2020 until the Transfer Date. If the Company is not able to transfer the trademarks to Merck on the Transfer Date, all consideration paid by Merck to the Company through the Transfer Date shall be refunded to Merck, and all rights associated with the Trademarks shall revert back to the Company.

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The carrying value of the trademarks underlying Cetrotide is \$nil and the Company received proceeds of \$16 (2021 - \$98) in the year ended December 31, 2022 and as of December 31, 2022 has received total proceeds of \$110 (2021 - \$98). Any proceeds that are received pursuant to the Cetrotide Agreement have been or will be recorded as a deferred gain in the Company's consolidated statement of financial position. The Company will recognize the entirety of the gain on the Transfer Date to the extent that the transfer is successful.

11. Goodwill

	December 31,	
	2022	2021
	\$	\$
Balance - Beginning of period	8,130	8,815
Impairment of goodwill	(7,642)	—
Impact of foreign exchange rate changes	(488)	(685)
Balance - End of period	—	8,130

The Company considers the relationship between its market capitalization and its book value, among other factors, when reviewing for indicators of impairment. As of December 31, 2022, the market capitalization of the Company was below the carrying value of its shareholders' equity, indicating a potential impairment of goodwill and impairment of the assets of the group of CGUs. For the year ended December 31, 2022, the recoverable amount of the group of CGUs was determined based on a fair value less cost of disposal ("FVLCD") model. FVLCD was determined based on a market approach and also derived from market data, including, information from market participants regarding the price that the Company could receive in a sale of the group of

CGUs. The fair value measurement is categorized as a level 2 fair value based on the inputs in the valuation techniques used. Management determined that value-in-use resulted in a lower estimated recoverable value than FVLCD. Based on the Company's assessment, the recoverable amount of the group of CGUs was lower than the carrying value and therefore an impairment charge was recorded on its goodwill and intangible assets for an amount of \$7,642 and \$372 respectively.

12. Payables and accrued liabilities

	December 31,	
	2022	2021
	\$	\$
Trade accounts payable	2,038	934
Accrued research and development costs	751	531
Accrued employee benefits	325	533
Payroll tax and other statutory liabilities	74	63
Other accrued liabilities	640	611
	3,828	2,672

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13. Provisions

	December 31,	
	2022	2021
	\$	\$
Balance - Beginning of period	277	371
Utilization of provision	(28)	(90)
Change in the provision	—	23
Unwinding of discount and impact of foreign exchange rate changes	(16)	(27)
Balances - End of the year	233	277
Less: current portion	45	34
Non-current portion	188	243

In 2013, the Company recognized a provision for certain non-cancellable contracts related to the Cetrotide activities, discussed in note 10, that were deemed onerous. The provisions for onerous contracts represent the present value of estimated unavoidable future royalty and patent costs associated with the intellectual property underlying Cetrotide.

14. Lease liabilities

	December 31,	
	2022	2021
	\$	\$
Balance - Beginning of period	161	184
Additions	38	15
Interest paid as charged to net loss as other finance costs	(4)	(7)
Payment against lease liabilities	(134)	(127)
Modification of lease liability	114	103
Impact of foreign exchange rate changes	4	(7)
Balances - End of the year	179	161
Current lease liabilities	114	130
Non-current lease liabilities	65	31

The Company and its landlord mutually agreed to a one-year plus 6 months' notice extension to its existing building lease agreement for its German subsidiary, continuing such terms until March 31, 2024, resulting in a modification being recorded to the lease liability in the amount of \$98 (2021 - \$103).

Future lease payments as of December 31, 2022 are as follows:

	\$
Less than 1 year	114
1 - 3 years	65
Total	179

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15. Employee future benefits

The Company has partially funded and unfunded defined benefit multi-employer pension plans and unfunded post-employment benefit plans in Germany. The plans are final salary pension plans, which provide benefits to members (or to their surviving dependents) in the form of a guaranteed level of pension payable for life. The level of benefits provided depends on the members' length of service and their salary in the final years leading up to retirement.

These plans are governed by the employment laws of Germany, which generally require final salary payments of each plan to be adjusted every third year for either an inflationary increase or a set 1% increase per annum. The form of increase varies for each plan and was an election made by each plan when it was initially established.

Since the pension liability is adjusted for either an increase in inflation or a set 1% increase per annum, the pension plan is exposed to the Company's inflation, interest rate risks and changes in the life expectancy for pensioners. As the plan assets include significant investments in listed equity shares of entities and real estate, the Company is also exposed to equity market and property market risk. A decrease in corporate bond yields will also increase plan liabilities, although this will be partially offset by an increase in the value of the plans' bond holdings.

In the past, certain Pension Benefit Plans were accounted for as defined contribution plans as sufficient information was not available for the Company to account for its proportionate share of the defined benefit obligation, plan assets and cost associated with such Pension Benefit Plans. In 2021, additional information became available to the Company, which began to account for its proportionate share of the defined benefit obligation and plan assets amounting to \$16,137 and \$11,963, respectively, which amounts were recorded through other comprehensive income.

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The change in the Company's accrued benefit obligations associated with the employee future benefit obligation is summarized for the years ended:

	December 31,		
	2022		2021
	Pension benefit plans	Other benefit plans	Total
	\$	\$	\$
Change in plan liabilities			
Balances – Beginning of the period	29,313	99	29,412
Current service cost	122	20	142
Interest cost	294	1	295
Actuarial gain arising from changes in financial assumptions	(5,903)	(12)	(5,915)
Past service cost associated with multi-employer plan	—	—	—
Actuarial loss arising from change in current assumptions on funding of future pension increases	—	—	—
Benefits paid	(742)	(10)	(752)
Impact of foreign exchange rate changes	(1,427)	(5)	(1,432)
Balances – End of the period	21,657	93	21,750
Change in plan assets			
Balances – Beginning of the period	11,927	—	11,927
Presentation of plan assets as of December 31, 2021	—	—	—
Interest income from plan assets	120	—	120
Employer contributions	45	—	45
Employee contributions	10	—	10
Benefits paid	(247)	—	(247)
Remeasurement of plan assets	(641)	—	(641)
Impact of foreign exchange rate changes	(623)	—	(623)
Balances – End of the period	10,591	—	10,591
Net liability of the unfunded plans	10,694	93	10,787
Net liability of the funded plans	372	—	372

Net amount recognized as Employee future benefits	11,066	93	11,159	17,485
Amounts recognized:				
In net loss	286	9	295	161
Actuarial gain (loss) on defined benefit plans and remeasurement of the net defined benefit liability in other comprehensive (gain) loss	5,262	—	5,262	(3,592)

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The Company's proportionate share of the multi-employer pension plan assets as of December 31, 2022 are as follows:

	December 31,	
	2022	2021
	\$	\$
Equity instruments (Level 1)	846	826
Debt instruments (Level 1)	6,302	7,445
Cash and cash equivalents (Level 1)	46	67
Real estate (Level 3)	2,079	2,207
Other (Level 3)	1,318	1,382
	10,591	11,927

The significant actuarial assumptions applied to determine the Company's accrued benefit obligations are as follows:

Actuarial assumptions	Pension Benefit Plans			Other benefit plans		
	Years ended December 31,			Years ended December 31,		
	2022	2021	2020	2022	2021	2020
	%	%	%	%	%	%
Discount rate	3.75	1.10	0.60	3.75	1.10	0.60
Pension benefits increase	2.00	0.50	0.50	2.00	0.50	0.50
Rate of compensation increase	2.50	2.50	2.00	2.50	2.50	2.00

Assumptions regarding future mortality are set based on actuarial advice in accordance with published statistics and experience in Germany. These assumptions translate into an average remaining life expectancy in years for a pensioner retiring at age 65:

	December 31,		
	2022	2021	2020
	Years	Years	Years
Retiring at the end of the reporting period:			
Male	21	21	20
Female	24	24	24

In accordance with the assumptions used as of December 31, 2022, undiscounted defined pension benefits expected to be paid are as follows:

	Total
	\$
2023	829
2024	895
2025	894
2026	926
2027	1,083
Thereafter	35,976
	40,603

The weighted average duration of the defined benefit obligation is 14.4 years (2021 - 16.0 years).

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If variations in the following assumptions had occurred during 2022, the impact on the Company's pension benefit obligation of \$21,657 as of December 31, 2022 would have been as follows:

Assumption	Increase	Decrease
Change in discount rate of 0.25%	(730)	771
Change in salary rate of 0.25%	16	(16)
Change in pension rate assumption by 0.25%	456	(438)
Change mortality by one year	1,014	(1,020)

Total expenses for the defined benefit plan that the Company accounts for as a defined contribution plan amounted to approximately \$20 for the year ended December 31, 2022 (2021 - \$45 and 2020 - \$38).

16. Share Capital

Authorized

The Company has unlimited number of common shares (being voting and participating shares) with no par value, as well as an unlimited number of preferred, first and second ranking shares, issuable in series, with rights and privileges specific to each class, with no par value.

Shareholder rights plan

Effective May 8, 2019, the shareholders re-approved the Company's shareholder rights plan (the "Rights Plan") that provides the board of directors and the Company's shareholders with additional time to assess any unsolicited take-over bid for the Company and, where appropriate, to pursue other alternatives for maximizing shareholder value. Under the Rights Plan, one right has been issued for each currently issued common share, and one right will be issued with each additional common share that may be issued from time to time.

Issued and outstanding	Common shares	Amount
	#	\$
Balance - December 31, 2019	799,780	224,528
Issuance of common shares, net of transaction costs	1,707,365	10,480
Balance - December 31, 2020	2,507,145	235,008
Issuance of common shares, net of transaction costs	943,448	29,082
Exercise of warrants, net of issuance costs upon exercise	1,404,443	29,301
Exercise of deferred share units	840	19
Balance - December 31, 2021	4,855,876	293,410
	—	—
Balance - December 31, 2022	4,855,876	293,410

On July 15, 2022, the Company's shareholders and board of directors approved an amendment to the Company's articles of incorporation to effect a 1-for-25 share consolidation (reverse split) of the Company's common shares. The Company's outstanding stock options, DSUs and warrants were also adjusted to reflect the 1-for-25 share consolidation (reverse split) of the Company's common shares. Accordingly, all common shares, DSU, warrants, stock options and per share amounts in these consolidated financial statements have been retroactively adjusted for all years presented to give effect to the share consolidation (reverse split). Outstanding warrant and stock options were proportionately reduced and the respective exercise prices, if applicable, were proportionately increased. The share consolidation (reverse split) was affected on July 21, 2022.

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2021

On February 19, 2021, the Company completed an underwritten public offering of 820,390 common shares at \$36.25 per common share, resulting in aggregate gross proceeds of \$29,739, less underwriting discounts, commissions and offering expenses of \$2,837 (the "February 2021 Financing"). The Company also granted to the underwriter and placement agent (the "Underwriter"), a 30-day over-allotment option to purchase up to 123,058 additional common shares at a price of \$36.25 per common share (the "Underwriter Option"). Additionally, the Company issued warrants underlying 57,427 common shares to the Underwriter, with each warrant bearing an exercise price of \$45.31 (the "February 2021 Placement Agent Warrants"). The February 2021 Placement Agent Warrants expire on February 17, 2026.

On February 22, 2021, the Underwriter exercised the Underwriter Option and received 123,058 common shares in exchange for gross proceeds to the Company of \$4,461. Upon exercise of the Underwriter Option, the Underwriter also received an additional 8,614 February 2021 Placement Agent Warrants.

Aggregate gross proceeds received in connection with the February 2021 Financing totaled \$34,200, less cash transaction costs of \$3,221 and non-cash transaction costs, which represent the issue-date fair value of the February 2021 Placement Agent Warrants, of \$1,897.

2020

On February 21, 2020, the Company closed a registered direct offering for 139,130 common shares, at a purchase price of \$32.25 per share, priced at-the-market. Additionally, 104,348 investor warrants were issued at an exercise price of \$30.00 per common share and 9,739 broker warrants were issued at an exercise price of \$40.50 per common share. The net cash proceeds to the Company from the offering totaled \$3,900. The gross proceeds of \$4,500 was allocated as \$2,325 to warrant liability based on the ascribed fair value and the remaining gross proceeds of \$2,174 were allocated to share capital. The transaction costs of \$600 were allocated between share capital and warrants based on their relative fair values. The fair value of the share capital was recorded within equity net of the allocated transaction costs. The transaction costs of \$311 allocated to the warrant liability were recorded as expense in the consolidated statement of loss and comprehensive loss.

On July 7, 2020, the Company closed a public offering of 1,066,667 units at a price of \$11.25 per unit, for net cash proceeds to the Company of \$10,596. Each unit contained one common share (or common share equivalent in lieu thereof) and one investor warrant to purchase one common share. In total, 1,066,667 common shares, 1,066,667 investor warrants at an exercise price of \$11.25 per share expiring July 7, 2025 (the "July 2020 Investor Warrants") and 74,661 placement agent warrants with an exercise price of \$14.06 per share, expiring July 1, 2025 (the "July 2020 Placement Agent Warrants") were issued. As these warrants were registered and can be settled for a fixed number of the Company's underlying common shares, the warrants meet the requirements of the fixed-for-fixed rule and have been classified as equity.

Because the warrants were classified as equity, the gross proceeds of \$12,000 were allocated as \$6,308 to share capital and \$5,691 to warrants based on their relative fair values. The transaction costs of \$1,420 were reduced from share capital and warrants in the amounts of \$754 and \$666, respectively, and charged to share issuance costs and classified as equity. The values ascribed to the share capital and warrants were recorded within equity, net of the allocated transaction costs.

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On August 5, 2020, the Company closed a securities purchase agreement of 497,115 common shares at a purchase price of \$14.08 per common share. The offering resulted in gross proceeds of \$7,000. Concurrently, the Company issued to the purchasers unregistered warrants to purchase up to an aggregate of 372,836 common shares. The warrants are exercisable for a period of five and one-half years, exercisable immediately following the issuance date and have an exercise price of \$11.75 per common share. In addition, the Company issued unregistered warrants to the placement agent to purchase up to an aggregate of 34,798 common shares, with an exercise price of \$17.60 per share and an expiration date of August 3, 2025. The gross proceeds of \$7,000 was allocated as \$3,944 to warrant liability based on the ascribed fair value and the remaining gross proceeds of \$3,056 were allocated to share capital. The transaction costs of \$748 were allocated between share capital and warrants based on their relative fair values. The fair value of the share capital was recorded within equity net of the allocated transaction costs of \$327. The transaction costs of \$421 allocated to the warrant liability were recorded as expense in the consolidated statement of loss and comprehensive loss.

17. Warrants

Warrant activity for the years ended December 31, 2022, 2021 and 2020, was as follows:

	Number	Weighted average exercise price	Amount
	#	\$	\$
December 31, 2019	—	—	—
Granted	1,141,328	11.44	5,025
Reclassification of warrant liability to equity	654,722	21.39	7,377
December 31, 2020	1,796,050	17.79	12,402
Granted	66,041	45.31	1,897
Exercised	(1,404,443)	14.31	(9,746)
Allocation of transaction costs to share capital	—	—	532
December 31, 2021	457,648	21.76	5,085
	—	—	—
December 31, 2022	457,648	21.76	5,085

Reclassification of warrant liability to equity

The Company had issued 133,000 unregistered investor warrants in the September 2019 closed direct offering (the "September

2019 Warrants”) as well as 104,348 unregistered investor warrants (the “February 2020 Investor Warrants”) and 9,739 unregistered placement agent warrants (the “February 2020 Placement Agent Warrants”) in the February 2020 closed direct offering transaction. The terms of the warrant agreement stated that if the warrants remained unregistered, the warrant holder could elect to exercise the warrants by way of a cashless exercise. This violated the fixed-for-fixed criterion due to the cashless exercise option, and accordingly these warrants had been accounted for as a liability.

Effective June 16, 2020, the Company registered the common shares underlying these warrants by way of a registration statement which eliminated the cashless exercise option on the warrants, on a one-for-one basis. Accordingly, as of June 16, 2020, the warrant liability was remeasured at fair value using the Black-Scholes option pricing model, with the amount of the remeasurement loss recognized in the consolidated statement of loss and comprehensive loss. The carrying value of the warrants was then reclassified from warrant liability to other capital within equity.

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The Company also issued 372,836 unregistered investor warrants (the “August 2020 Investor Warrants”) and 34,799 unregistered placement agent warrants (the “August 2020 Placement Agent Warrants”) in the August 2020 registered direct offering transaction. The terms of the warrant agreement stated that if the warrants remained unregistered, the warrant holder could elect to exercise the warrants by way of a cashless exercise. This violated the fixed-for-fixed criterion due to the cashless exercise option, and accordingly these warrants were accounted for as a liability on issuance and measured at fair value using the Black-Scholes option pricing model. Effective September 14, 2020, the Company registered the common shares underlying these warrants by way of a registration statement which eliminated the cashless exercise option on the warrants, on a one-for-one basis. Accordingly, as of September 14, 2020, the warrant liability was remeasured at fair value using the Black-Scholes option pricing model, with the amount of the remeasurement loss recognized in the consolidated statement of loss and comprehensive loss. The carrying value of the warrants was then reclassified from warrant liability to other capital within equity.

The fair values of warrants are estimated using the Black-Scholes option pricing model. The weighted average assumptions used in the Black-Scholes valuation model for the periods presented were as follows:

	Years ended December 31,	
	2021	2020
Expected dividend yield	0.00%	0.00%
Expected volatility	119.18%	116.50%
Risk-free annual interest rate	0.59%	0.31%
Expected life (years)	4.99	5.09
Weighted average share price	\$ 37.00	\$ 14.84
Weighted average exercise price	\$ 45.31	\$ 20.74

The expected volatility of these warrants was determined using historical volatility rates and the expected life was determined based on time to expiry from the issuance date.

18. Other capital

At the 2018 annual and special meeting of shareholders, the Company’s shareholders approved the adoption of the 2018 long-term incentive plan (the “LTIP”), which allows the Board of Directors to issue up to 11.4% of the total issued and outstanding common shares at any given time to eligible individuals at an exercise price to be determined by the Board of Directors at the time of the grant, subject to a ceiling, as stock options, stock appreciation rights, stock awards, deferred stock units (“DSUs”), performance shares, performance units, and other stock-based awards. This LTIP replaces the stock option plan (the “Stock Option Plan”) for its directors, senior executives, employees and other collaborators who provide services to the Company. Options granted under the LTIP expire after seven years following the date of grant, vest over three years, beginning one year after date of grant. The Company’s Board of Directors amended the Stock Option Plan on March 20, 2014 and the Company’s Shareholders approved, ratified and confirmed the Stock Option Plan on May 10, 2016. Options granted under the Stock Option Plan prior to the 2014 amendment expire after a maximum period of 10 years following the date of grant. Options granted after the 2014 amendment expire after a maximum period of seven years following the date of grant.

Stock options

The Company settles stock options exercised through the issuance of new common shares as opposed to purchasing common shares on the market to settle stock option exercises.

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The compensation expense for the year end December 31, 2022 was \$142 (2021 - \$107 and 2020 - (\$51)) recognized over the vesting period. Option activity for the years ended December 31, 2022, 2021 and 2020, was as follows:

	Number	Weighted average exercise price (US\$)	Number	Weighted average exercise price (CAD\$)
	#	\$	#	\$
December 31, 2019	29,645	90.25	18	22.80
Granted	7,200	9.15	—	—
Canceled/Forfeited	(13,214)	64.00	—	—
Expired	(3,375)	53.50	(18)	22.80
December 31, 2020	20,256	36.43	—	—
Granted	23,200	10.51	—	—
Expired	(1)	14,000.00	—	—
December 31, 2021	43,455	21.95	—	—
Granted	2,000	8.88	—	—
Canceled/Forfeited	(2,900)	14.49	—	—
Expired	(525)	165.08	—	—
December 31, 2022	42,030	20.05	—	—

On January 17, 2023, subsequent to year end, the Company granted 14,000 stock options under the LTIP. The stock options will be exercisable at \$3.75 per share and will have a term of seven years and will vest over a period of three years.

The table below shows the assumptions, or weighted average parameters, applied to the Black-Scholes option pricing model in order to determine share-based compensation costs over the life of the awards.

	Years ended December 31,		
	2022	2021	2020
Expected dividend yield	0.00%	0.00%	0.00%
Expected volatility	115.75%	115.80%	112.50%
Risk-free annual interest rate	1.59%	1.23%	0.27%
Expected life (years)	5.72	5.71	4.02
Weighted average share price	\$ 8.88	\$ 10.51	\$ 9.15
Weighted average exercise price	\$ 8.88	\$ 10.51	\$ 9.15
Weighted average grant date fair value	\$ 7.47	\$ 8.82	\$ 6.79

The expected volatility of these stock options was determined using historical volatility rates and the expected life was determined using the weighted average life of past options issued.

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At December 31, 2022, the following options were outstanding:

	Options outstanding			Options exercisable		
	Number	Weighted average remaining contractual life	Weighted average exercise price	Number	Weighted average remaining contractual life	Weighted average exercise price
Range of US dollar stock option exercise prices	(#)	(years)	(\$)	(#)	(years)	(\$)
8.88 to 10.00	8,800	5.20	9.09	4,538	4.95	9.15
10.01 to 20.00	21,200	5.96	10.51	7,072	5.96	10.51
20.01 to 30.00	6,000	3.91	22.68	6,000	3.91	22.68
50.01 to 60.00	3,400	2.21	51.99	3,400	2.21	51.99
60.01 to 87.50	2,630	0.84	86.37	2,630	0.84	86.37
	42,030	4.89	20.05	23,640	4.14	27.74

Deferred share units

The compensation expense for the year end December 31, 2022 was \$402 (2021 - \$204 and 2020 - \$112) and is presented in selling, general and administrative expenses. DSU activity for the years ended December 31 are:

Years ended December 31,

	2022	2021	2020
	#	#	#
Balance - Beginning of the year	16,920	6,920	8,480
Granted	80,000	11,200	4,800
Exercised	—	(1,200)	(6,360)
Balance - End of the year	96,920	16,920	6,920

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19. Expenses by nature

	Years ended December 31,		
	2022	2021	2020
	\$	\$	\$
Inventory expensed during the year	54	—	2,317
Provision for obsolete inventory	32	—	—
Third-party research and development	11,244	5,534	692
Salaries, wages and benefits	3,563	3,037	2,789
Professional and consulting fees	2,475	2,570	2,185
Insurance	1,687	1,077	861
Stock-based compensation	544	311	61
Software and IT services	386	387	275
Depreciation and amortization	135	144	232
Marketing, communications and investor relations	317	289	34
Impairment of goodwill	7,642	—	—
(Reversal of) impairment of other assets	124	—	(139)
Impairment of intangible assets	584	—	—
Travel, meals and entertainment	225	111	49
Office, rent and telecommunications	120	162	272
License fees	19	139	27
Other	92	170	(78)
Gain on modification of building lease	—	—	(219)
	29,243	13,931	9,358

20. Compensation of key management

Key management includes the Corporation's Directors, Chief Executive Officer, Chief Financial Officer, Chief Scientific Officer and Chief Medical Officer. Compensation awarded to key management is summarized as follows:

	Years ended December 31,		
	2022	2021	2020
	\$	\$	\$
Salaries and short-term benefits	1,848	1,646	1,540
Consultant's fees	17	163	167
Post-retirement benefits	63	70	86
Stock-based compensation	460	295	160
	2,388	2,174	1,953

Most of the employment agreements entered into between the Company and its executive officers include termination provisions, whereby the executive officers would be entitled to receive benefits that would be payable if the Company were to terminate the executive officers' employment without cause or if their employment is terminated following a change of control. Separation benefits generally are calculated based on an agreed-upon multiple of applicable base salary and incentive compensation and, in certain cases, other benefit amounts.

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21. Supplemental disclosure of cash flow information

	Years ended December 31,		
	2022	2021	2020
	\$	\$	\$
Changes in operating assets and liabilities:			
Trade and other receivables	592	120	(1,023)
Inventory	(161)	(56)	1,182
Prepaid expenses and other current assets	(783)	(750)	(702)
Payables and accrued liabilities	1,076	634	51
Income taxes payable	—	(109)	395
Deferred revenues	441	3,010	3,031
Provision for restructuring and other costs	(2)	—	—
Employee future benefits	(559)	(349)	(532)
	<u>604</u>	<u>2,500</u>	<u>2,402</u>

22. Income taxes

Significant components of the current and deferred income tax recovery (expense) for the years ended December 31, 2022, 2021 and 2020 are as follows:

	Years ended December 31,		
	2022	2021	2020
	\$	\$	\$
Current income tax recovery (expense)	—	109	(395)
Deferred tax:			
Origination and reversal of temporary differences	2,885	1,291	1,509
Change in unrecognized tax assets	(2,885)	(1,291)	(1,509)
Total income tax recovery (expense)	<u>—</u>	<u>109</u>	<u>(395)</u>

From time to time, the Company is subject to tax audits. While the Company believes that its filing positions are appropriate and supportable, periodically, certain matters are challenged by tax authorities. Although the Company believes its tax provisions are adequate, the final determination of tax audits and any related disputes could be materially different from historical income tax provisions and accruals. In 2020, AEZS Germany underwent a tax audit regarding the taxation years 2013 to 2016. As of December 31, 2022 and 2021, the tax authorities concluded the audit for those years. The subsequent years remain unaudited, and the Company has accrued \$108 as an uncertain tax provision for those years.

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The reconciliation of the combined Canadian federal and provincial corporate income tax rate to the income tax expense is provided below:

	Years ended December 31,		
	2022	2021	2020
Combined Canadian federal and provincial statutory income tax rate	26.5%	26.5%	26.5%

	Years ended December 31,		
	2022	2021	2020
	\$	\$	\$
Income tax recovery based on combined statutory income tax rate	6,023	2,246	1,252
Change in unrecognized tax assets	(2,885)	(1,291)	(1,872)
Share issuance costs	—	367	363
Permanent difference attributable to impairment of goodwill	(2,407)	—	—
Impact of expiring investment tax credits	(1,559)	(1,724)	(481)
Provision to filed return adjustments	106	151	—
Permanent difference attributable to net change in fair value of warrant liability	—	—	304
Share-based compensation costs	(144)	(82)	(16)
Difference in statutory income tax rate of foreign subsidiaries	902	226	99
Uncertain tax position	—	—	(123)
Other	(36)	216	79
	<u>—</u>	<u>109</u>	<u>(395)</u>

Loss before income taxes is attributable to the Company's tax jurisdictions as follows:

	Years ended December 31,		
	2022	2021	2020
	\$	\$	\$
Germany	(16,756)	(4,383)	(2,042)
Canada	(5,679)	(3,860)	(2,463)
United States	(292)	(234)	(218)
Total loss before income taxes	(22,727)	(8,477)	(4,723)

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Significant components of deferred tax assets and liabilities are as follows:

	December 31,	
	2022	2021
	\$	\$
Deferred tax assets		
Operating losses carried forward	582	205
Intangible assets	—	776
	582	981
Deferred tax liabilities		
Accounts receivable	—	375
Payables and accrued liabilities	450	7
Property and equipment	55	47
Deferred revenues	—	492
Other	77	60
	582	981
Deferred tax assets (liabilities), net	—	—

Significant components of unrecognized deferred tax assets and losses are as follows:

	December 31,	
	2022	2021
	\$	\$
Unrecognized deferred tax assets		
Deferred revenues and other provisions	1,475	1,680
Operating losses carried forward	87,445	87,734
Capital losses carried forward	210	105
SR&ED Pool	9,138	9,138
Unused tax credits	1,559	2,945
Employee future benefits	1,317	3,396
Property and equipment	524	523
Intangible assets	95	—
Share issuance expenses	781	1,110
Other	294	84
Unrecognized deferred tax assets	102,838	106,715

Deferred income tax assets are recognized to the extent that the realization of the related tax benefit through reversal of temporary differences and future taxable profits is probable. Based on the current forecasted future taxable profits and reversal of temporary differences, the company does not believe it will have sufficient future earnings to offset the deferred tax assets and has an unrecognized deferred tax asset balance of \$102,838.

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As of December 31, 2022, the Corporation has total accumulated non-capital losses of \$84,234 federally and \$82,833 provincially, which may be carried forward for twenty years and used to reduce taxable income in future years. The Corporation has not recognized deferred tax assets on any of the non-capital losses, due to the uncertainty that there will be sufficient taxable income or that the taxable temporary differences will be reversing in the same reporting period and jurisdiction. The losses will be expiring as follows:

	Canada	
	Federal	Provincial
	\$	\$
2028	8,054	6,668
2029	4,791	4,773
2030	4,104	4,089
2031	1,753	1,737
2032	4,250	4,250
2033	3,721	3,721
2034	4,153	4,153
2035	10,418	10,452
2036	10,592	10,592
2037	7,343	7,343
2038	6,557	6,557
2039	3,501	3,501
2040	3,808	3,808
2041	4,822	4,822
2042	6,367	6,367
	84,234	82,833

The Company has non-refundable R&D investment tax credits of approximately \$1,559 which can be carried forward to reduce Canadian federal income taxes payable and which expire at dates ranging from 2023 to 2035. Furthermore, the Company has unrecognized tax assets in respect of operating losses to be carried forward in Germany and in the US. The federal tax losses amount to approximately \$208,656 in Germany (€ 195,006) for which there is no expiry date, and to \$5,095 in the US. The losses in the US will be expiring as follows:

	United States
	\$
2028	369
2029	178
2034	151
2035	447
2036	195
2037	709
indefinite	1,224
indefinite	771
indefinite	516
indefinite	535
	5,095

The operating loss carryforwards and the tax credits claimed are subject to review, and potential adjustment, by tax authorities. Other deductible temporary differences for which tax assets have not been booked are not subject to a time limit, except for share issuance expenses which are amortizable over five years.

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23. Capital management

The Company's objective in managing capital, consisting of shareholders' equity, with cash and cash equivalents and restricted cash equivalents being its primary components, is to ensure sufficient liquidity to fund R&D costs, selling expenses, general and administrative expenses and working capital requirements. Over the past several years, the Company has raised capital via public and private equity offerings and issuances as its primary source of liquidity, as discussed in note 24. The capital management objective of the Company remains the same as that in previous periods. The policy on dividends is to retain cash to keep funds available to finance the activities required to advance the Company's product development portfolio and to pursue appropriate commercial opportunities as they may arise.

The Company is not subject to any capital requirements imposed by any regulators or by any other external source.

24. Financial instruments and financial risk management

Financial assets and liabilities as of December 31, 2022 and 2021 are presented below.

December 31, 2022	Financial assets at amortized cost	Financial liabilities at amortized cost
	\$	\$
Cash and cash equivalents	50,611	—
Trade and other receivables	457	—
Restricted cash equivalents	322	—
Payables and accrued liabilities	—	3,752
Lease liability	—	179
	51,390	3,931

December 31, 2021	Financial assets at amortized cost	Financial liabilities at amortized cost
	\$	\$
Cash and cash equivalents	65,300	—
Trade and other receivables	1,065	—
Restricted cash equivalents	335	—
Payables and accrued liabilities	—	2,609
Lease liability	—	161
	66,700	2,770

Assets and liabilities, such as value added taxes, that are not contractual and that arise as a result of statutory requirements imposed by governments, do not meet the definition of financial assets or financial liabilities and are, therefore, excluded from trade and other receivables and payables and accrued liabilities.

Fair value

IFRS 13, *Fair Value Measurement* ("IFRS 13") establishes a hierarchy that prioritizes the inputs used to measure fair value. The hierarchy gives the highest priority to unadjusted quoted prices in active markets for identical assets or liabilities (Level 1 measurement) and the lowest priority to unobservable inputs (Level 3 measurement).

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The input levels discussed in IFRS 13 are:

Level 1 – Unadjusted quoted prices in active markets for identical assets or liabilities.

Level 2 – Inputs other than quoted prices included within Level 1 that are observable for an asset or liability, either directly (i.e. prices) or indirectly (i.e. derived from prices).

Level 3 – Inputs for an asset or liability that are not based on observable market data (unobservable inputs).

Financial risk factors

The following provides disclosures relating to the nature and extent of the Company's exposure to risks arising from financial instruments, including credit risk, liquidity risk and foreign exchange risk and how the Company manages those risks.

(a) Credit risk

Credit risk is the risk of an unexpected loss if a customer or counterparty to a financial instrument fails to meet its contractual obligations. The Company regularly monitors credit risk exposure and takes steps to mitigate the likelihood of this exposure resulting in losses. The Company's exposure to credit risk currently relates to the financial assets at amortized cost in the table above. The Company holds its available cash in amounts that are readily convertible to known amounts of cash and deposits its cash balances with financial institutions that have an investment grade rating of at least "P-2" or the equivalent. This information is supplied by independent rating agencies where available and, if not available, the Company uses publicly available financial information to ensure that it invests its cash in creditworthy and reputable financial institutions. Once there are indicators that there is no reasonable expectation of recovery, such financial assets are written off but are still subject to enforcement activity.

As of December 31, 2022, three counterparties included in trade accounts receivable comprised a total receivable of approximately \$403 (2021 - \$932) of which \$nil (2021 - \$55) was past due, considered to be impaired and fully provided for.

Generally, the Company does not require collateral or other security from customers for trade accounts receivable; however, credit is extended following an evaluation of creditworthiness. In addition, the Company performs ongoing credit reviews of all of its customers and determines expected credit losses. On this basis, as of December 31, 2022, the Company has provided for all outstanding and unpaid amounts relating to its operations.

The maximum exposure to credit risk approximates the amount recognized in the Company's consolidated statement of financial position.

(b) Liquidity risk

Liquidity risk is the risk that the Company will not be able to meet its financial obligations as they become due. As indicated in note 23, the Company manages this risk through the management of its capital structure by monitoring rolling forecasts of the Company's cash and cash equivalents on the basis of expected cash flows.

Management concluded that the Company has sufficient cash on hand to meet its obligations as they become due for the next 12 months, considering the Company's planned research and development activities, selling expenses, general and administrative expenses and working capital requirements. The Company has the ability to scale its research and development activities, and will do so as necessary, based on cash availability. While the Company has \$ 50,611 in cash and cash equivalents at December 31, 2022, it continues to have an ongoing need for additional capital resources to research and develop, commercialize and manufacture its products and technologies.

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All of the Company's financial liabilities except lease liabilities are current liabilities with expected settlement dates within one year. The maturity analysis for lease liabilities is disclosed in note 14.

(c) Foreign exchange risk

Entities using the Euro as their functional currency

The Company is exposed to foreign exchange risk due to its investments in foreign operations whose functional currency is the Euro. As of December 31, 2022, if the US dollar had increased or decreased by 10% against the Euro, with all other variables held constant, net loss for the year ended December 31, 2022 would have been lower or higher by approximately \$823 (2021 - \$300 and 2020 - \$110).

25. Segment information

The Company operates in a single operating segment, being the biopharmaceutical segment.

Geographical information

Revenues by geographical area have been allocated to geographic regions based on the country of residence of the Company's external customers or licensees and are detailed as follows:

	Years ended December 31,		
	2022	2021	2020
	\$	\$	\$
Switzerland	5,395	5,075	905
Ireland	82	—	73
Denmark	160	185	2,655
Other	3	—	19
	<u>5,640</u>	<u>5,260</u>	<u>3,652</u>

Non-current assets include restricted cash equivalents, right of use assets, property and equipment, identifiable intangible assets, other asset and goodwill (2021 only) and are detailed by geographical area as follows:

	December 31,	
	2022	2021
	\$	\$
Germany	463	9,212
Canada	4	—
United States	71	70
	<u>538</u>	<u>9,282</u>

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26. Net loss per share

The following table sets forth pertinent data relating to the computation of basic and diluted net loss per share attributable to common shareholders.

	Years ended December 31,		
	2022	2021	2020
	\$	\$	\$
Net loss	(22,727)	(8,368)	(5,118)
Basic and diluted weighted-average number of shares outstanding	4,855,876	4,596,980	1,643,327
Items excluded from the calculation of diluted net loss per share due to their anti-dilutive effect:			
Stock options and DSUs	138,950	60,375	27,176
Share purchase warrants	457,648	457,648	1,796,050

27. Commitments

Significant expenditure contracted for at the end of the reporting period but not recognized as liabilities is as follows:

	Service and manufacturing	R&D contracts	TOTAL
	\$	\$	\$
Less than 1 year	9,250	1,577	10,827
1 - 3 years	1,362	218	1,580
4 - 5 years	29	—	29
More than 5 years	—	—	—
	10,641	1,795	12,436

In 2021, the Company executed various agreements including in-licensing and similar arrangements with development partners (note 10). Such agreements may require the Company to make payments on achievement of stages of development, launch or revenue milestones, although the Company generally has the right to terminate these agreements at no penalty. The Company may have to pay up \$38,458 upon achieving certain sales volumes, regulatory or other milestones related to specific products.

28. Subsequent event

On March 15, 2023, with the Company's consent, Consilient Health entered into an assignment agreement to transfer the current licensing agreement for the commercialization of macimorelin in the European Economic Area and the United Kingdom to Atrahs Pharma UK Limited ("Pharmanovia"). Also on March 15, 2023, the Company and Pharmanovia entered into an exclusive supply agreement, pursuant to which the Company agreed to provide the Licensed Product to Pharmanovia.

29. Reclassification of comparative figures

Certain comparative amounts in the consolidated statements of financial position, consolidated statements of loss and comprehensive loss and the notes to these consolidated financial statements have been reclassified to conform to the presentation adopted in the current year.

Item 19. Exhibits

Exhibit Index

- 1.1 [Restated Certificate of Incorporation and Restated Articles of Incorporation of the Registrant \(incorporated by reference to Exhibit 99.2 to the Registrant's report on Form 6-K furnished to the Commission on May 25, 2011\)](#)
- 1.2 [Certificate of Amendment and Articles of Amendment of the Registrant \(incorporated by reference to Exhibit 99.2 to the Registrant's report on Form 6-K furnished to the Commission on October 3, 2012\)](#)
- 1.3 [Certificate of Amendment and Articles of Amendment of the Registrant \(incorporated by reference to Exhibit 99.1 to the Registrant's report on Form 6-K furnished to the Commission on November 17, 2015\)](#)
- 1.4 [Amended and Restated By-Law One of the Registrant \(incorporated by reference to Exhibit 1.3 of the Registrant's Annual Report on Form 20-F for the financial year ended December 31, 2012 filed with the Commission on March 22, 2013\)](#)
- 2.1 [Amended and Restated Shareholder Rights Plan Agreement between the Registrant and Computershare Trust Company of Canada, as Rights Agent, dated as of May 8, 2019 \(incorporated by reference to Exhibit 99.2 to the Registrant's report on Form 6-K furnished to the Commission on May 9, 2019\)](#)
- 2.2 [Description of Securities Registered Under Section 12 of The Exchange](#)
- 4.1 [Second Amended and Restated Stock Option Plan of the Registrant \(incorporated by reference to Exhibit 4.1 of the Registrant's Annual Report on Form 20-F for the financial year ended December 31, 2013 filed with the Commission on March 21, 2014\)](#)
- 4.2 [2018 Long-Term Incentive Plan of the Registrant \(incorporated by reference to Exhibit 4.7 of the Registrant's Form S-8 filed with the Commission on May 8, 2018\)](#)

- 4.3 [License and Assignment Agreement, dated January 16, 2018 by and between Aeterna Zentaris GmbH and Strongbridge Ireland Limited \(incorporated by reference to Exhibit 99.2 of the Registrant's report on Form 6-K furnished to the Commission on January 19, 2018\)](#)
- 4.4 [Form of Warrant Agreement \(incorporated by reference to Exhibit 99.1 of the Registrant's report on Form 6-K furnished to the Commission on September 20, 2019\)](#)
- 4.5 [Placement Agency Agreement between the Registrant and Maxim Group LLC, dated as of September 20, 2019 \(incorporated by reference to Exhibit 99.2 of the Registrant's report on Form 6-K furnished to the Commission on September 20, 2019\)](#)
- 4.6 [Form of Securities Purchase Agreement by and between the Registrant and certain institutional investors, dated as of September 20, 2019 \(incorporated by reference to Exhibit 99.3 of the Registrant's report on Form 6-K furnished to the Commission on September 20, 2019\)](#)
- 4.7 [Form of Investor Warrant \(incorporated by reference to Exhibit 99.1 of the Registrant's report on Form 6-K furnished to the Commission on February 21, 2020\)](#)
- 4.8 [Form of Placement Agent Warrant \(incorporated by reference to Exhibit 99.4 of the Registrant's report on Form 6-K furnished to the Commission on February 21, 2020\)](#)
- 4.9 [Form of Common Share Purchase Warrant \(incorporated by reference to Exhibit 4.5 of the Registrant's Registration Statement on Form F-1 filed with the Commission on June 30, 2020\)](#)
- 4.10 [Form of Pre-Funded Warrant \(incorporated by reference to Exhibit 4.6 of the Registrant's Registration Statement on Form F-1 filed with the Commission on June 30, 2020\)](#)
- 4.11 [Form of Placement Agent Warrant \(incorporated by reference to Exhibit 4.7 of the Registrant's Registration Statement Form F-1 filed with the Commission on June 30, 2020\)](#)
- 4.12 [Form of Investor Warrant \(incorporated by reference to Exhibit 99.1 of the Registrant's report on Form 6-K furnished to the Commission on August 5, 2020\)](#)
- 4.13 [Form of Placement Agent Warrant \(incorporated by reference to Exhibit 99.5 of the Registrant's report on Form 6-K furnished to the Commission on August 5, 2020\)](#)
- 4.14 [Amendment Agreement dated November 16, 2020, by and between Aeterna Zentaris GmbH and Novo Nordisk Biopharm Limited. \(incorporated by reference to Exhibit 99.1 of the Registrant's report on Form 6-K furnished to the Commission on November 16, 2020\)](#)
- 4.15 [License Agreement effective December 7, 2020, by and between Aeterna Zentaris GmbH and Consilient Health Ltd. \(incorporated by reference to Exhibit 99.1 of the Registrant's report on Form 6-K furnished to the Commission on December 7, 2020\)](#)
- 4.16 [Engagement Letter dated February 14, 2021 between the Registrant and H.C. Wainwright & Co.](#)
- 4.17 [Novo Nordisk Early - Termination of Amendment Agreement \("Agreement"\) dated as of 16 November 2020](#)
- 8.1 [Subsidiaries of the Registrant](#)

- 11.1 [Code of Conduct and Business Ethics of the Registrant \(incorporated by reference to Exhibit 11.1 of the Registrant's Annual Report on Form 20-F for the financial year ended December 31, 2017 filed with the Commission on March 28, 2018\)](#)
- 11.2 [Code of Business Conduct and Ethics for Members of the Board of Directors \(incorporated by reference to Exhibit 11.2 of the Registrant's Annual Report on Form 20-F for the financial year ended December 31, 2014 filed with the Commission on March 17, 2015\)](#)
- 11.3 [Audit Committee Charter of the Registrant \(incorporated by reference to Exhibit 11.3 of the Registrant's Annual Report on Form 20-F for the financial year ended December 31, 2014 filed with the Commission on March 17, 2015\)](#)
- 12.1 [Certification of the Principal Executive Officer pursuant to §302 of the Sarbanes-Oxley Act of 2002](#)
- 12.2 [Certification of the Principal Financial Officer pursuant to §302 of the Sarbanes-Oxley Act of 2002](#)
- 13.1 [Certification of the Principal Executive Officer pursuant to 18 U.S.C. Section 1350 as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002](#)
- 13.2 [Certification of the Principal Financial Officer pursuant to 18 U.S.C. Section 1350 as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002](#)
- 15.1 [Consent of Ernst &Young LLP](#)
- 15.2 [Consent of PricewaterhouseCoopers LLP](#)

Exhibit Index

- 101. Inline INS XBRL Instance Document
- 101. Inline SCH XBRL Taxonomy Extension Schema
- 101. Inline CAL XBRL Taxonomy Extension Schema Calculation Linkbase
- 101. Inline DEF XBRL Taxonomy Extension Schema Definition Linkbase
- 101. Inline LAB XBRL Taxonomy Extension Schema Label Linkbase
- 101. Inline PRE XBRL Taxonomy Extension Schema Presentation Linkbase
- 104 Cover Page Interactive Data File (embedded within the Inline XBRL document)

SIGNATURES

The registrant hereby certifies that it meets all of the requirements for filing on Form 20-F and that it has duly caused and authorized

the undersigned to sign this annual report on its behalf.

AETERNA ZENTARIS INC.

/s/ Klaus Paulini

Klaus Paulini

President and Chief Executive Officer

Date: March 22, 2023