In Pursuit of Medical Innovations

November 2022
Corporate Presentation

Forward-Looking Statements

This document contains forward looking statements (as defined by applicable securities legislation) made pursuant to the safe harbor provision of the US Securities Litigation Reform Act of 1995 and forward-looking information (as defined under applicable Canadian securities laws), which reflect the current expectations regarding future events of Aeterna Zentaris Inc. (the “Company”, “we”, “our”). Forward looking statements and forward-looking information may include, but are not limited to statements preceded by, followed by, or that include the words " will," “expects," “believes," “intends," “would," “could," “plans,” or “”planned” and similar terms that relate to future events, performance, or our results.

Such statements include, but are not limited to, the Company’s ability to deliver multiple development and regulatory milestones with respect to diagnostics, therapeutics and vaccines, including developing manufacturing processes for immunomodulating therapeutics and selection of development candidates, the potential of oral Coronavirus vaccines to induce mucosal immunity to prevent infection and avoid transmission, the Company’s expectations regarding the development and manufacturing of oral Coronavirus vaccines, the potential use of Macrilen™ macimorelin as a therapeutic, including its use as a potential treatment for Amyotrophic Lateral Sclerosis (ALS, Lou Gehrig’s disease), the size, timing and scope of our commercial and development pipeline for AIM biologicals, AEZS-150, macimorelin as a therapeutic and oral Coronavirus vaccines, the Company’s expectations regarding its cash runway and its ability to fund operations beyond 2023 and the expected timing of future key milestones, studies, agreements and approvals.

Forward looking statements and forward-looking information contained in this presentation are based on our opinions, estimates and assumptions in light of our experience and perception of historical trends, current conditions and expected future developments, as well as other factors that we currently believe are appropriate and reasonable in the circumstances. There can be no assurance that the underlying opinions, estimates and assumptions will prove to be correct.

Forward looking statements involve known and unknown risks and uncertainties, including those discussed in this presentation and in our Annual Report on Form 20F, 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 US Securities and Exchange Commission. Known and unknown risks and uncertainties could cause our actual results to differ materially from those in forward looking statements and forward-looking information. Such risks and uncertainties include, among others, our heavy dependence on the success of Macrilen™ macimorelin and related out licensing arrangements and the continued availability of funds and resources to successfully develop and commercialize Macrilen™ and our in licensed products and technologies, the ability of the Company to enter into licensing, development, manufacturing and marketing and distribution agreements with other pharmaceutical companies, universities or others and keep such agreements in effect (including that the Company the Company may be unable to successfully negotiate a license agreement for any technology or products for which it has an option), the Company’s ability to identify therapeutic uses for Macrilen™ macimorelin or to in license other product candidates, the Company’s reliance on third parties for the manufacturing and commercialization of Macrilen™ macimorelin, potential delay or termination or lack of success of any of our pre clinical or clinical programs, potential disputes with third parties leading to delays in or termination of the manufacturing, development, licensing or commercialization of our products or resulting in significant litigation or arbitration, and, more generally, uncertainties related to the regulatory process, the degree of market acceptance of Macrilen™ macimorelin, the impact of securities class action litigation, shareholder lawsuits or other litigation on our cash flow, results of operations and financial position, our ability to protect our intellectual property, general changes in economic conditions and the impact of the COVID-19 pandemic on our operations, plans and prospects, including to the initiation and completion of clinical trials in a timely manner or at all.

Readers of this presentation should consult our quarterly and annual filings with the Canadian and US securities commissions for additional information on risks and uncertainties Given these uncertainties and risk factors, readers are cautioned not to place undue reliance on these forward looking statements and forward looking information The forward looking statements and information in this presentation are made as of the date hereof and we disclaim any obligation to update any such factors or to publicly announce any revisions to any of the forward looking statements or forward looking information contained herein to reflect future results, events or developments, unless required to do so by a governmental authority or applicable law.

Certain Other Matters

Any graphs, tables or other information demonstrating our historical performance or that of any other entity contained in this presentation are intended only to illustrate past performance of such entities and are not necessarily indicative of future performance. This presentation does not purport to contain all of the material information with respect to the Company and is not a recommendation that any person should make an investment in the Company. Moreover, this presentation does not constitute an offer to sell or a solicitation of an offer to buy or acquire securities of the Company in any jurisdiction or an inducement to enter into investment activity, nor may it or any part of it form the basis of or be relied on in connection with any contract or commitment whatsoever. Any reference to “$” or “dollars” means United States dollars.

Investment Highlights

Specialty biopharmaceutical company developing and commercializing a diversified portfolio of pharmaceutical and diagnostic products

Executing on strategy to rapidly advance lead programs through key milestones

Strong financial position with runway expected to fund operations beyond 2023[1]

Therapeutics

Diagnostics

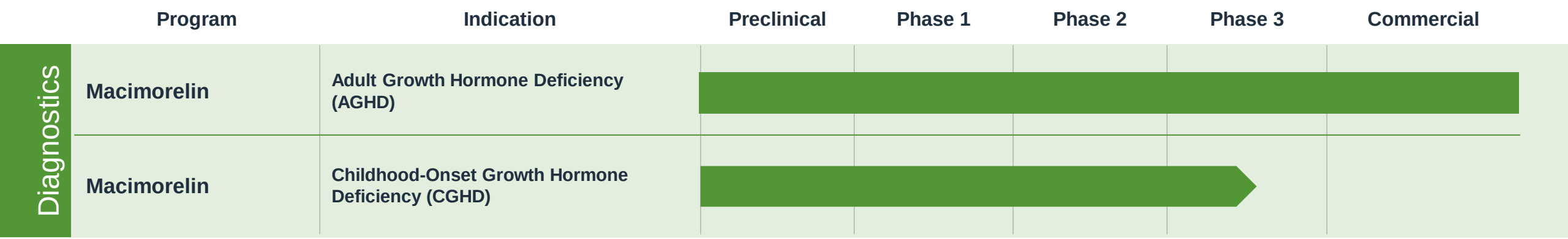
Vaccines

1: Based on Management's current expectations and planned development activities

Pipeline Targeting Multiple High-Value Indications with Significant Unmet Need

	Program	Indication	Preclinical	Phase 1	Phase 2	Phase 3
Therapeutics	AIM Biologicals	Parkinson's Disease (PD)		Presented positive preclinical results at IMMUNOLOGY2022™		
		Neuromyelitis Optica Spectrum Disorder (NMOSD)		Positive PoC data presented at 13th Intl. Congress on Autoimmunity (Athens, June 2022)		
	Macimorelin	Amyotrophic Lateral Sclerosis (ALS, Lou Gehrig's disease)		Proof-of-concept studies in ALS disease models ongoing; formalized preclinical tox and safety testing initiated		
	AEZS-150 (Delayed clearance parathyroid hormone)	Chronic Hypoparathyroidism		Development of manufacturing process and *in-vivo* testing of development candidate progressing		
Vaccine	Salmonella-Based Vaccine Platform	COVID-19 (SARS-CoV-2)		Immunization studies ongoing		
		Chlamydia Trachomatis		Optimization of candidate strains ongoing, establishment of challenge model initiated		

Diagnostic Commercial and Development Pipeline



U.S./Canada[1]	European Union / UK	Israel and Palestine Authority	Turkey and some Balkan Countries	Korea	ROW
novo nordisk	Consilient Health	MegaPharm We Know The Way	ER-KIM	Pharmbio Korea Inc.	ÆTERNA ZENTARIS

1. *Aeterna Zentaris Set to Regain Full Rights to Macrilen™ (Macimorelin) in U.S. and Canada from Novo Nordisk in May 2023. Ongoing effort to identify strategic development and commercialization partner*

ÆTERNA ZENTARIS

AIM Biologicals

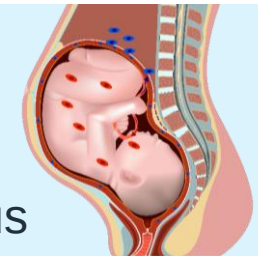
Targeted Immunomodulating Therapeutics for the treatment of Parkinson's Disease (PD) and Neuromyelitis Optica Spectrum Disorder (NMOSD)

Antigen-Specific Immunomodulation

AIM Biologicals

Platform Technology Enabling Highly Specific Treatments for Auto-Immune Diseases with Well-Defined Target Antigens

MHC class I molecules (HLA-G)
Mechanism based on the immune tolerance induced by maternal immune system during pregnancy to protect fetus



Applications Across Multiple Indications
Ability to optimize with disease-specific antigen to induce immune tolerance

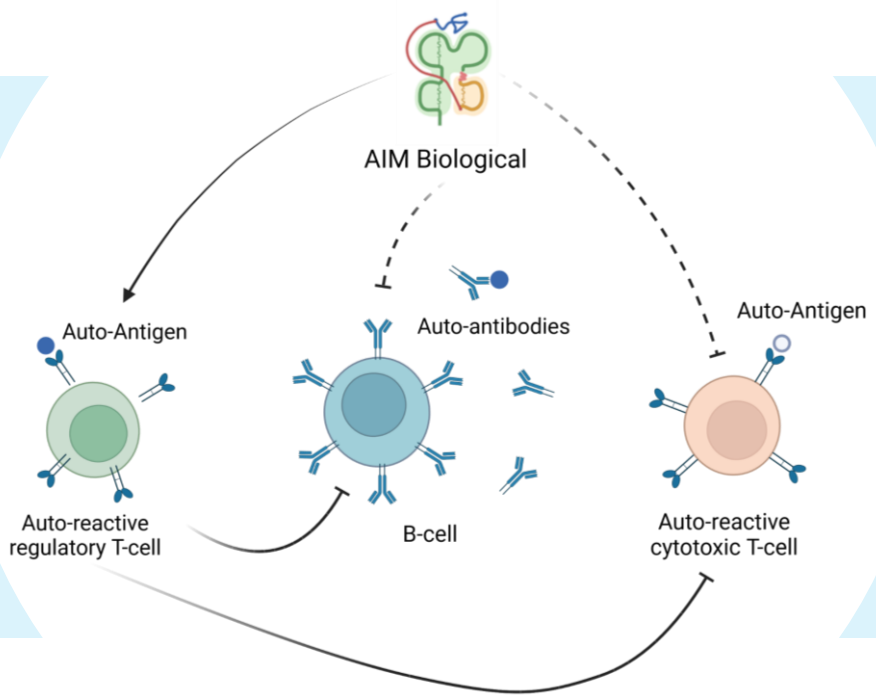


Image adapted from BioRender.com (2022)

Advancing as Treatment for Parkinson's Disease

Growing evidence suggests that PD could be considered as an autoimmune disease[1]

Targeting α-Synuclein (α-Syn), hallmark for degeneration of dopaminergic neurons in the substantia nigra (SN)

Total addressable market of over ~9 million people[2]

Recent Highlights:

- ✓ Design and production of antigen-specific AIM biologics molecules
- ✓ *In-vitro* and *in-vivo* assessments in relevant disease models

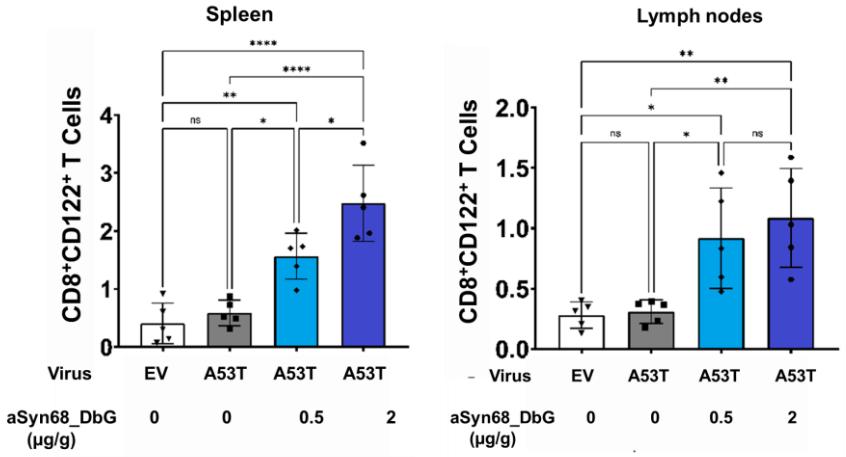
Next Steps:

- Optimization of AIM biologics molecules (ongoing)
- *In-vitro* and *in-vivo* profiling to select development candidate (ongoing)
- Manufacturing process development for selected candidate

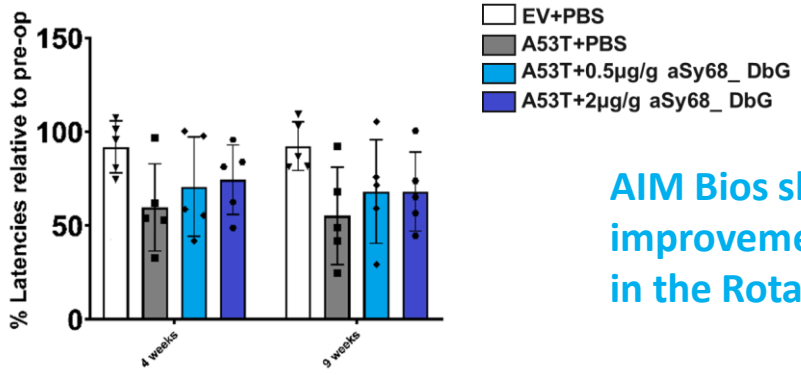
1: Bonam et al.; Autoimmunity Reviews 2020
2: World Health Organization. (n.d.). Parkinson disease. World Health Organization

Demonstrated Improvements in Preclinical Parkinson's Disease Model

Significant induction of regulatory T cells, improvement in motor function and rescue of substantia nigra neurons

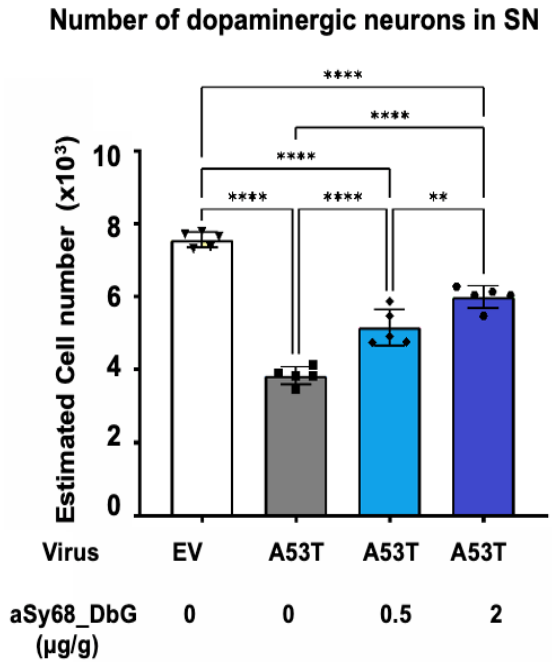


AIM Bios induce regulatory CD8+CD122+ T cells in spleen and lymph nodes



AIM Bios show a trend towards improvement of motor function in the Rotarod test

Significantly improves survival of SN neurons



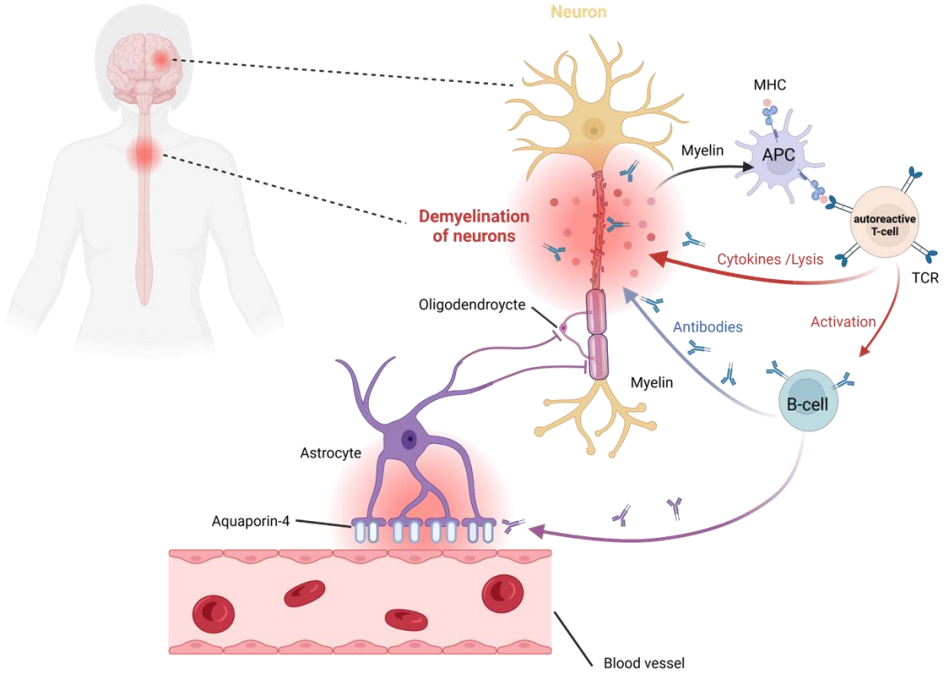
Selective Treatment Option for Neuromyelitis Optica Spectrum Disorder (NMOSD)

Well-defined antigen: Aquaporin-4 (AQP4)

NMOSD is a seriously debilitating and often fatal, auto-antibody mediated inflammatory CNS orphan disorder with significant unmet medical need affecting 1 per 100,000 people[1]

Next Steps:

- *In-vitro* and *in-vivo* assessments to select development candidate (ongoing)
- Manufacturing process development for selected candidate



- Pathogenic auto-antibodies directed against AQP4 target and damage astrocytes, resulting in inflammatory lesions of the optic nerve(s), spinal cord and brain

Image adapted from BioRender.com (2022)

Macimorelin

Ghrelin Agonist for the treatment of Amyotrophic Lateral Sclerosis (ALS, Lou Gehrig's disease)

Macimorelin for the Treatment of ALS

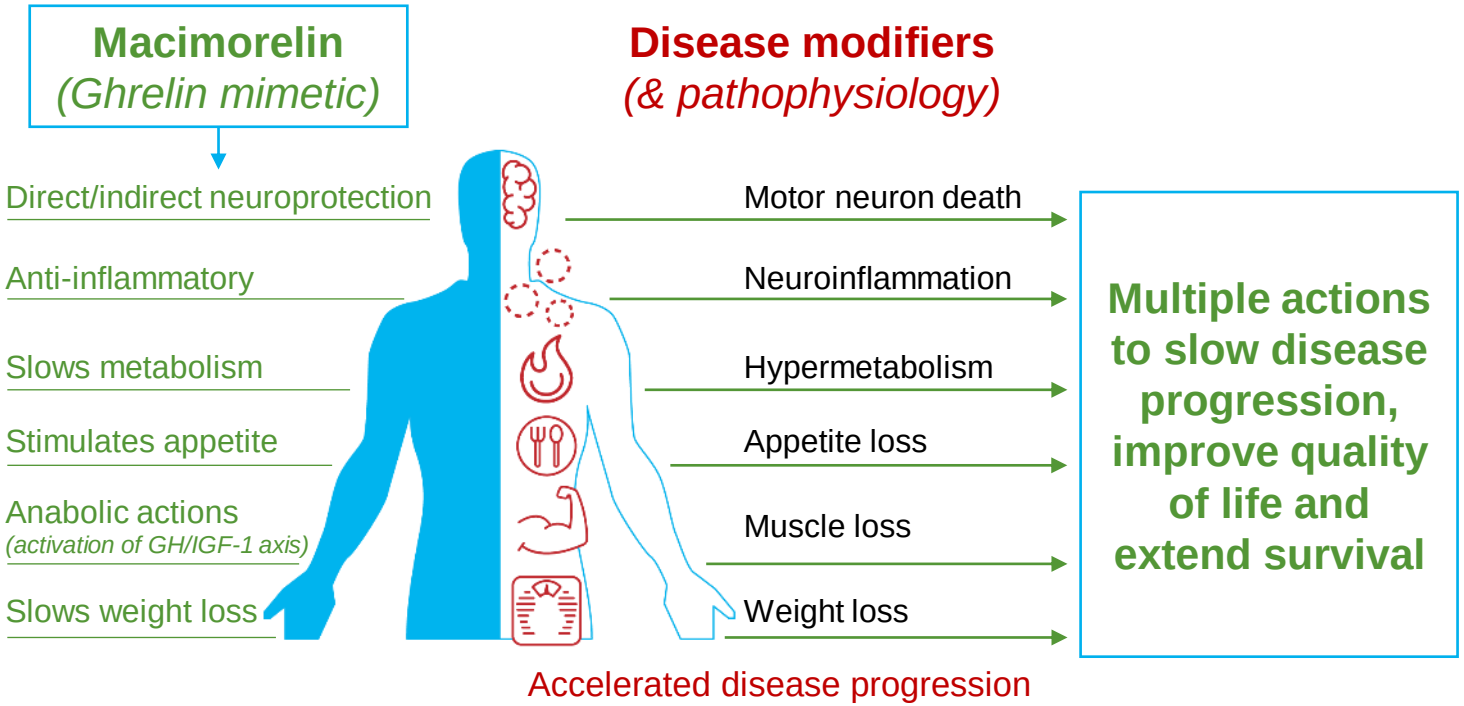
Importance of Ghrelin and the GH/IGF-1 axes in ALS[1]

- Stimulates appetite and lowers metabolic rate to promote weight gain
- Regulates the release of the neuroprotective and anabolic hormones growth hormone (GH) and insulin-like growth factor-1 (IGF-1)
- Acts via the GHSR1a, which is expressed throughout the body, including the cerebral cortex, spinal cord and muscle (i.e. tissues directly impacted in ALS)
- Majority of motor neuron disease (MND) patients have a moderate to marked GH deficiency[2]
- Treatment with ghrelin or the ghrelin mimetic GHRP3 was shown to slow weight loss, improvement of muscle strength, and extension of survival in the SOD1G93A mouse model of ALS[3]

1: Bianchi et al., International Journal of Molecular Sciences, 2017, 18.
2: Steyn et al., Endocrinology. 2012 Aug;153(8):3735-46. Impairments to the GH-IGF-I Axis in hSOD1G93A Mice Give Insight into Possible Mechanisms of GH Dysregulation in Patients with Amyotrophic Lateral Sclerosis
3: Ngo et al., J Neuroendocrinol. 2021 Jan 29;33(7):e12938. Ghrelin as a treatment for amyotrophic lateral sclerosis.

Potential to Slow ALS Disease Progression

Macimorelin is a Ghrelin mimetic and modulates various disease-relevant processes



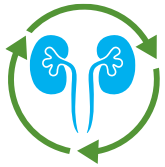
Next Steps:

- Development of alternative formulations progressing
- Proof of concept with macimorelin in disease specific SOD1 mouse model (ongoing)
- TDP-43 transgenic mouse model
- Formalized pre-clinical development (tox and safety studies) initiated

AEZS-150

Delayed Clearance Parathyroid Hormone Fusion Polypeptides DC-PTH for the treatment of Primary Hypoparathyroidism

Delayed Clearance Parathyroid Hormone (DC-PTH) Fusion Polypeptide



PTH is a key regulating hormone essential for calcium homeostasis and renal phosphate clearance

Potential to be a self-administered pen to help maintain normal serum calcium and phosphate levels in a once weekly treatment versus current daily injections

Hypoparathyroidism

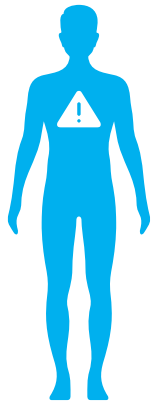
Body produces abnormally low levels of PTH

affects

Orphan indication

~23-37 per 100,000[1]

causes



- Renal dysfunction
- Muscle cramping
- Twitching
- Seizures
- Cardiac arrhythmias

1: Edafe and Balasubramanian; Gland Surgery 2017, 559-568

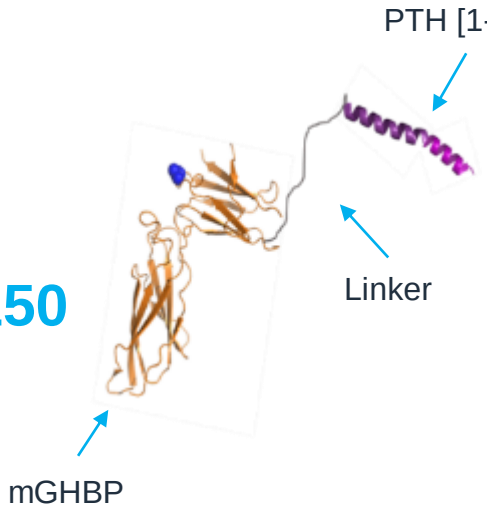
Promising Preclinical Results

AEZS-150: Fusion-Protein of PTH [1-34] coupled via a linker to a modified growth-hormone binding protein (GHBP)[1]

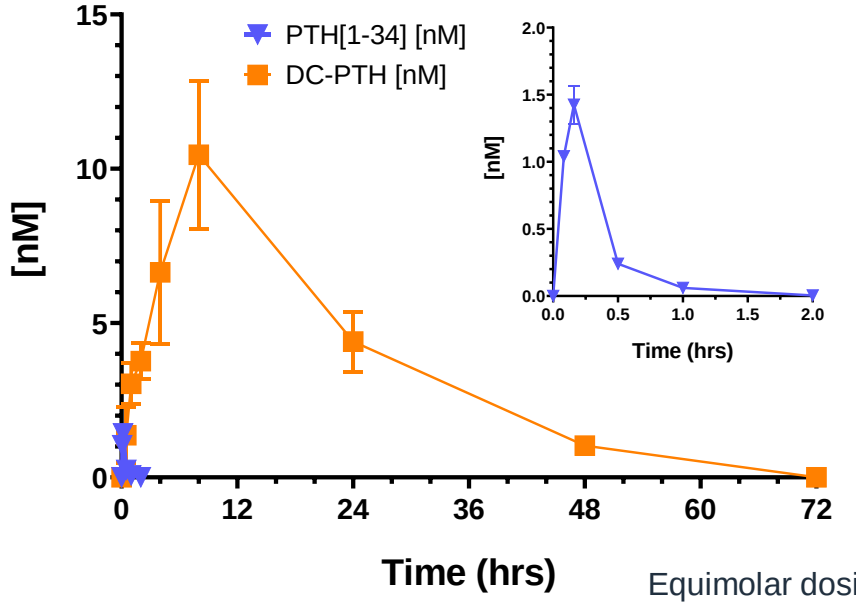
Delayed clearance in comparison to PTH[1-34]

Potential to control serum calcium levels by once weekly treatment

AEZS-150



Plasma Pharmacokinetics in a Rat Study[2]



Equimolar dosing of 20 nmol/kg

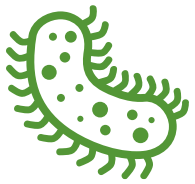
Next Steps:
- In depth characterization of development candidate (*in-vitro* and *in-vivo*)
- Manufacturing process development ongoing

1: WO 2018/197895A1
2: Wilkinson et al.; Poster presentation at ENDO Meeting 2019

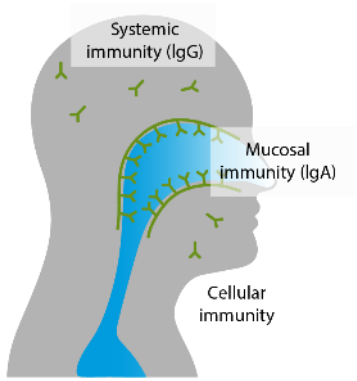
Salmonella-Based Vaccine Platform

Live-attenuated bacterial vaccine for COVID-19 (SARS-CoV-2) and Chlamydia Trachomatis

Salmonella-Based Vaccine Platform



Live-attenuated bacterial vaccine based on the *Salmonella typhi Ty21a* carrier strain currently used as a typhoid vaccine



Potential to induce mucosal immunity, not only in respiratory, but also in urogenital tract, providing barrier for pathogens entering the body

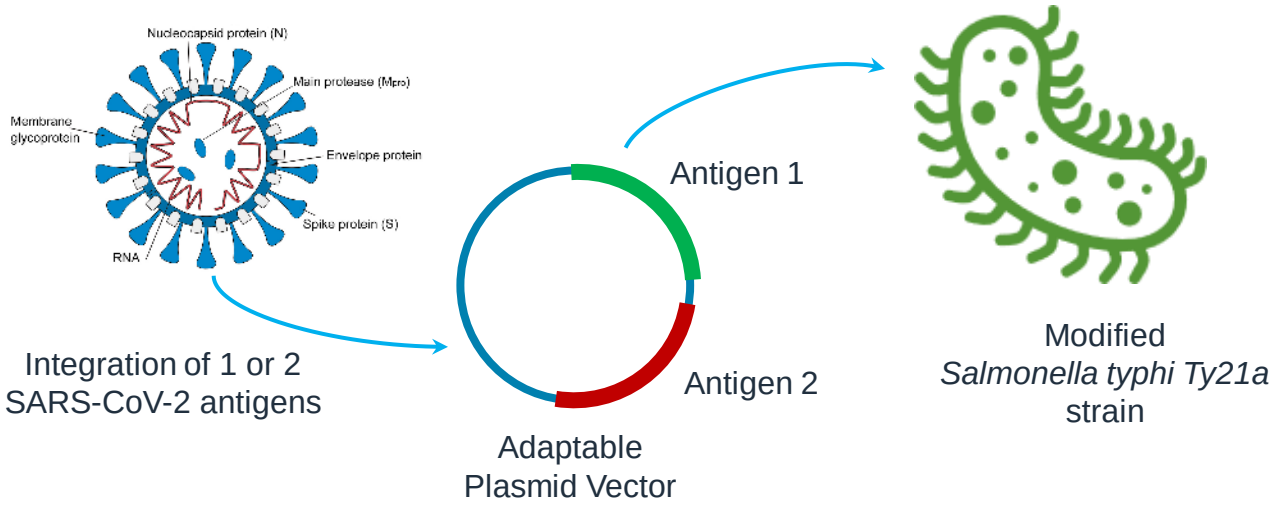
→ Potential to evade infection

→ Potential to avoid transmission

- ✓ Potential for temperature stable supply chain: ~2°C - 8°C[1]
- ✓ Potential to induce systemic and mucosal immunity to prevent infection
- ✓ Adaptable antigen expression
- ✓ Salmonella Typhi Ty21a carrier strain has been safely used worldwide in more than 150 million administered doses1

Oral Coronavirus (SARS-CoV-2) Vaccine

Currently undergoing pre-clinical studies for the prevention of coronavirus diseases, including COVID-19 (SARS-CoV-2)



Induction of Immunity

Potential to induce mucosal immunity to prevent infection and avoid transmission

Multiple-Antigens

Higher likelihood for improved defense against mutated virus variants if not only spike protein is used as antigen

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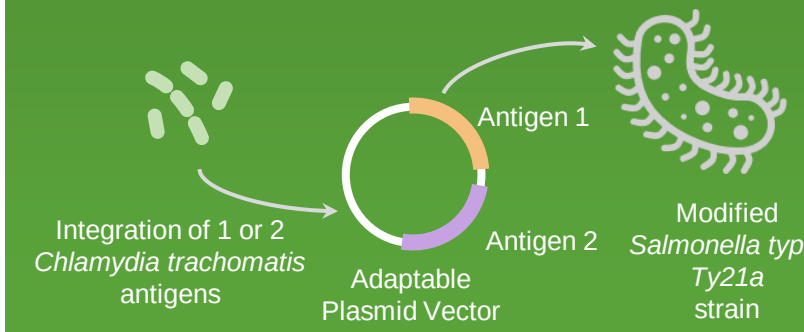
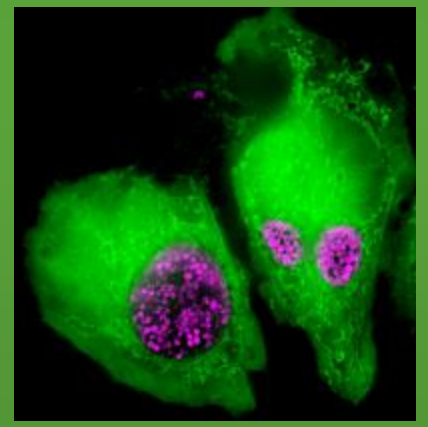
Chlamydia Trachomatis Vaccine

- Sexually transmitted gram-negative bacterium infecting over 130 million subjects annually
- Asymptomatic disease can spread to the reproductive tract inducing infertility, miscarriage, or ectopic pregnancy
- Ocular infections can lead to inclusion conjunctivitis or trachoma, which is the primary source of visual impairment or infectious blindness
- In-depth expertise and well-established advanced disease models at University of Wuerzburg[2]





Chlamydia trachomatis (magenta)
in human cells (green)

Infection with *Chlamydia trachomatis* leads to visual impairment or infectious blindness of about 1.9 million people[1]

Approximately 4% of women with chlamydial lower genital tract infection will develop chronic pelvic pain, 3% infertility, and 2% adverse pregnancy outcome.[3]

Next Steps:
- Design and preparation of candidate vaccine strains (ongoing)
- *In-vivo* immunology experiments and challenge studies

[1] https://www.who.int/news-room/fact-sheets/detail/trachoma
[2] https://www.biozentrum.uni-wuerzburg.de/en/mikrobio/forschungsschwerpunkte/chlamydiales
[3] *Paavonen and Eggert-Kruse, Hum Reprod Update Sep-Oct 1999;5(5):433-47.*

Macimorelin / Macrilen™

A Disruptive Oral Diagnostic Test Solution for Growth Hormone Deficiency

First and only AGHD test approved by US FDA and European Commission

Growth Hormone is Critical to Lifelong Health

Produced by the pituitary gland
(located at the base of the brain)

Children

Promotes growth

Reduction in auxological parameters:

- Short stature
- Low growth velocity (speed) for age
- Increased fat around the waist
- Delayed tooth development

Adults

Maintains normal body stature and regulates metabolism

No clear signs or symptoms, but recognized by:

- Metabolic syndrome
- Osteoporosis
- Muscle wasting
- Impaired quality of life

Increased risk of:

- Cardiovascular (CV) issues
- Bone fractures

Macimorelin

Only Approved Oral Diagnostic for GHD

No Other FDA or EC Approved Oral Test

Insulin tolerance test (ITT) considered the "Gold Standard" in GHD detection procedures[1,2]

Not FDA or EC approved or regulated

"[ITT Test] is increasingly used less frequently in the U.S. because of safety concerns." [2]

"Because the **macimorelin** test is simple, well tolerated with minimal side effects, and of shorter duration with only 3 to 4 blood draws compared to other GH–stimulation tests, it is anticipated that its use will increase over time." [2]

"Very promising test that is easy to conduct with high reproducibility, safety, and diagnostic accuracy comparable to the ITT…test" [2]

1: *Molitch et al. J Clin Endocrinol Metab.* 2011; 1587-1609
2: AACE 2019 Guidelines: American Association Of Clinical Endocrinologists And American College Of Endocrinology Guidelines For Management Of Growth Hormone Deficiency In Adults And Patients Transitioning From Pediatric To Adult Care, 2019

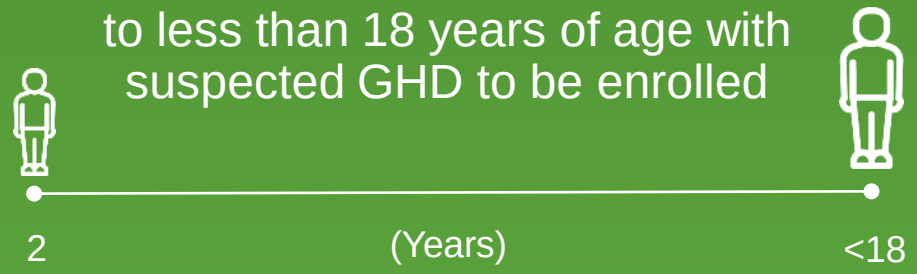
Pivotal Phase 3 DETECT[1] Study for Diagnosis of CGHD

Currently Enrolling Subjects and Dosing is Underway

- Open-label, single dose, multicenter, multinational

  US, Germany, Poland, Georgia, Italy, Serbia, Romania and Slovenia
- Macimorelin GHST will be performed twice (for repeatability data)
- Two standard GHSTs as controls: arginine (i.v.), clonidine (p.o.)
- Design suitable to support claim for potential of macimorelin as stand-alone test
- The impact of delays due to the COVID-19 pandemic and the Russian invasion of Ukraine – two countries where we planned to recruit patients – will extend the recruitment phase towards the end of 2023.
- Mitigation activities ongoing aiming at additional countries

Children and adolescents from 2 to less than 18 years of age with suspected GHD to be enrolled



≥ 100 subjects worldwide

≥ 40 pre-pubertal and 40 pubertal subjects

≥ 25 subjects expected to be enrolled in the U.S.

1: NCT 04786873 ClinicalTrials.gov

Macimorelin Commercial Rights

Actively seeking commercial partners in ROW

U.S. / Canada

Novo Nordisk:
- Commercial and co-development agreement
- Funding 100% of budgeted DETECT study up to €9 million
- Returning full rights to Macrilen™ (Macimorelin) in U.S. and Canada to Aeterna Zentaris in May 2023

Aeterna Zentaris
- Robust business development efforts to identify and secure a new development and commercialization partner

License Agreement
- Territories: Europe and the United Kingdom
- Pricing and reimbursement milestones
- Royalties on sales
- Aeterna Zentaris controls supply chain and provides finished product according to supply agreement

License Agreement on Development and Commercialization
in Republic of Korea

Distribution and Commercialization Agreement
in Israel and the Palestine Authority

Distribution and Commercialization Agreement
in Turkey and some Balkan countries

Aeterna Zentaris Owns Worldwide Rights
Outside Europe, Israel and Palestine Authority

Corporate Overview

Financial Snapshot

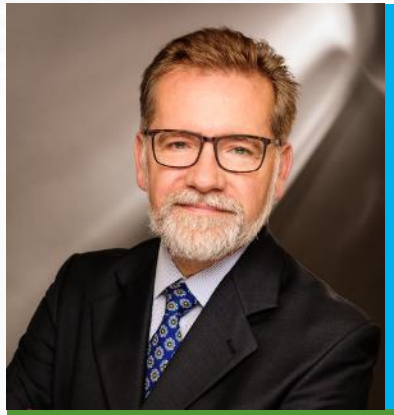
NASDAQ: AEZS / TSX: AEZS

Cash runway expected to fund operations through 2023[1]

~$54M	~$20M	~4.9M	~11K
Cash on Hand As of September 30, 2022	Market Cap[2]	Shares Outstanding[3]	10-day Avg. Volume[4]

1: Based on Management's current expectations and planned development activities
2: Based on November 4, 2022 closing price of $4.01 per share on NASDAQ and the number of issued and outstanding AEZS shares on that date
3: Information as of September 30, 2022
4: Based on information as of November 4, 2022 for the 10-day average daily trading volume on NASDAQ

Management



Klaus Paulini, PhD
President and Chief Executive Officer; Managing Director, Aeterna Zentaris GmbH

Eckhard Guenther, PhD
SVP Business Development and Alliance Management
Managing Director, Aeterna Zentaris GmbH

Giuliano La Fratta
SVP Finance, Chief Financial Officer

Nicola Ammer, MD
SVP Clinical Development, Chief Medical Officer

Michael Teifel, PhD
SVP Non-Clinical Development, Chief Scientific Officer

Investment Summary

Advancing diversified pipeline across multiple high-value therapeutic areas

Targeting High-Value Indications

- **Auto-immune diseases**
- **Neurodegenerative disease**
- **Endocrine disorders**
- **Viral infections**

Development and Commercial Diagnostics

AGHD

Only oral drug indicated for diagnosis of adult growth hormone deficiency

CGHD

Expanding into childhood growth hormone deficiency

Significant Cash Runway

Strong Financial Position with Runway Expected to Fund Operations Beyond 2023[1]

1: Based on Management's current expectations and planned development activities

In Pursuit of Medical Innovations

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