ÆTERNA ZENTARIS

In Pursuit of Medical Innovations

May 2023

Corporate Presentation

Forward-Looking Statements

This document contains statements that may constitute forward-looking statements within the meaning of U.S. and Canadian securities legislation and regulations and such statements are made pursuant to the safe-harbor provision of the U.S. Securities Litigation Reform Act of 1995. Forward-looking statements are frequently, but not always, identified by words such as "expects," "aiming", "anticipates," "believes," "intends," "potential," "possible," and similar expressions. Such statements, based as they are on current expectations of management, inherently involve numerous risks, uncertainties and assumptions, known and unknown, many of which are beyond our control.

Forward-looking statements in this document include, but are not limited to, those relating to Aeterna's expectations regarding: its preclinical and clinical studies, , its ability to secure regulatory approvals for Macrilen™, its efforts to obtain a development and commercialization partner for Macrilen™ in the U.S. and Canada and the ability to meet its currently anticipated cash needs into 2025.

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 DETECT clinical trial in the European Union and U.S. for Macrilen™ (macimorelin) in CGHD; results from our ongoing or planned pre-clinical studies and our DETECT clinical trial under development may not be successful or may not support advancing the product further in pre-clinical studies, to human clinical trials or regulatory approval; 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; the global instability due to the global pandemic of COVID-19 and the war in the Ukraine, and their 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. Investors should consult our quarterly and annual filings with the Canadian and U.S. securities commissions for additional information on risks and uncertainties, including those risks discussed in our Annual Report on Form 20-F and annual information form, under the caption "Risk Factors". Given the uncertainties and risk factors, readers are cautioned not to place undue reliance on these forward-looking statements. We disclaim any obligation to update any such factors or to publicly announce any revisions to any of the forward-looking statements contained herein to reflect future results, events or developments, unless required to do so by a governmental authority or applicable law.

No securities regulatory authority has either approved or disapproved of the contents of this news release. The Toronto Stock Exchange accepts no responsibility for the adequacy or accuracy of this release.

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

Streamlined strategy focused on rapidly advancing development programs to go/no-go decisions maximizes opportunity while conserving capital

Strong financial position with sufficient capital to fund operations and develop programs through 2024 and into 2025[1]

Diagnostics

Macimorelin:

- Approved for diagnosis of adult growth hormone deficiency (GHD)
- Ongoing Phase 3 clinical trial for the diagnosis of childhood-onset GHD

Therapeutics

Autoimmunity Modifying ("AIM") Biologicals:

- Targeted, highly specific autoimmunity modifying therapeutics in NMOSD and Parkinson's

AEZS-150:

- Fusion Polypeptide: Potential treatment for chronic hypoparathyroidism

AEZS-130: Macimorelin

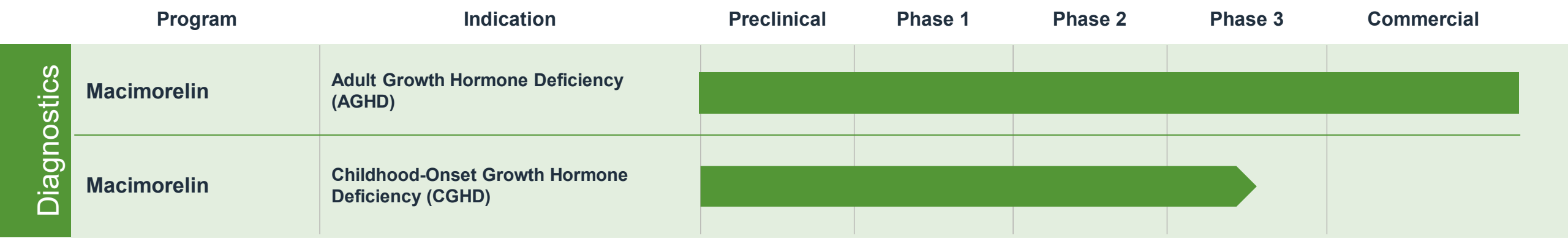
- Ghrelin agonist in development for the treatment of ALS (Lou Gehrig's disease)

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

Therapeutic Pipeline Targeting Multiple High-Value Indications

Program	Indication	Preclinical	Phase 1	Phase 2	Phase 3
AIM Biologicals	Neuromyelitis Optica Spectrum Disorder (NMOSD)	→	Demonstrated positive pre-clinical proof-of-concept in NMOSD and PD Completing comprehensive pre-clinical data package Entered into an R&D agreement with Massachusetts General Hospital to conduct preclinical *ex-vivo* and *in-vivo* studies in NMOSD Scientific advice meetings with regulatory authorities expected Q3 2023		
	Parkinson's Disease (PD)	→			
AEZS-150 (Delayed clearance parathyroid hormone)	Chronic Hypoparathyroidism	→	Progressing toward establishment of master cell bank and GMP manufacturing Planning to meet with regulatory authorities in mid-2023 to discuss best development path forward		
AEZS-130 (Macimorelin)	Amyotrophic Lateral Sclerosis (ALS, Lou Gehrig's disease)	→	Ongoing efficacy evaluation in transgenic mouse ALS models with results expected by Q2 2023 Following PoC studies, planning to meet with regulatory authorities to discuss best development path forward Tox and safety studies ongoing and based on existing body of data		

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	Pharmanovia	MegaPharm We Know The Way	ER-KIM	Pharmbio Korea Inc.	ÆTERNA ZENTARIS

1. Sales of Macrilen® (macimorelin) will be temporarily discontinued in the United States commercial market for the diagnosis of adult growth hormone deficiency ("AGHD"), effective May 23, 2023 and until anticipated re-launch with an alternate commercialization partner. This temporary action follows the August 29, 2022 announced decision by Aeterna's former North American commercialization partner Novo Nordisk Healthcare AG ("Novo Nordisk") to end its license agreement for this product in North America. Aeterna has Ongoing effort to identify strategic development and commercialization partner.

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AIM Biologicals

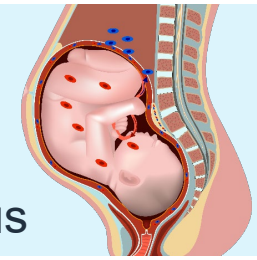
Targeted, Highly Specific Autoimmunity Modifying Therapeutics for the Potential Treatment of Neuromyelitis Optica Spectrum Disorder ("NMOSD") and Parkinson's Disease ("PD")

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

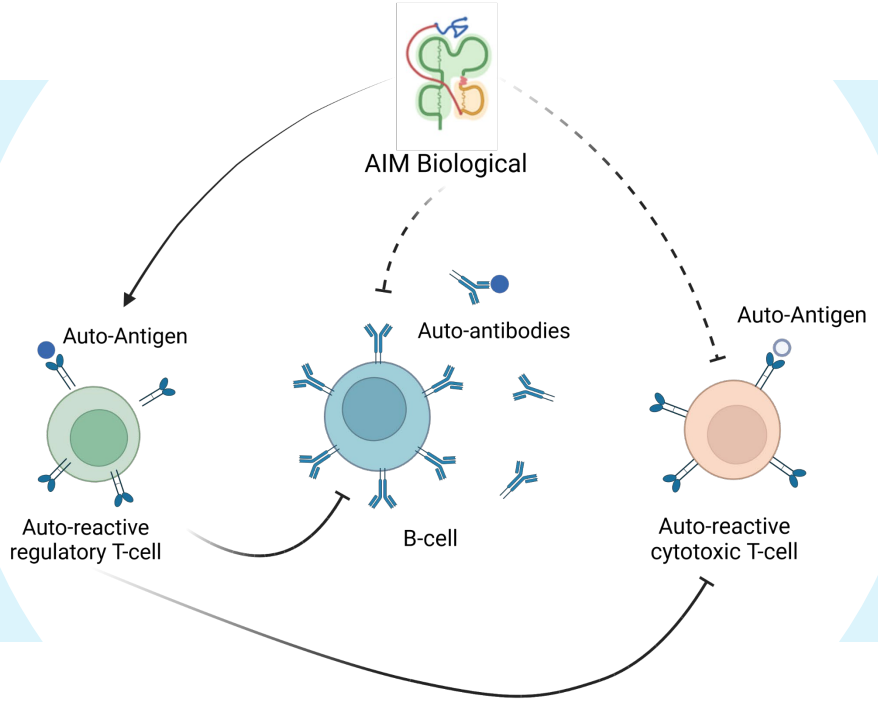


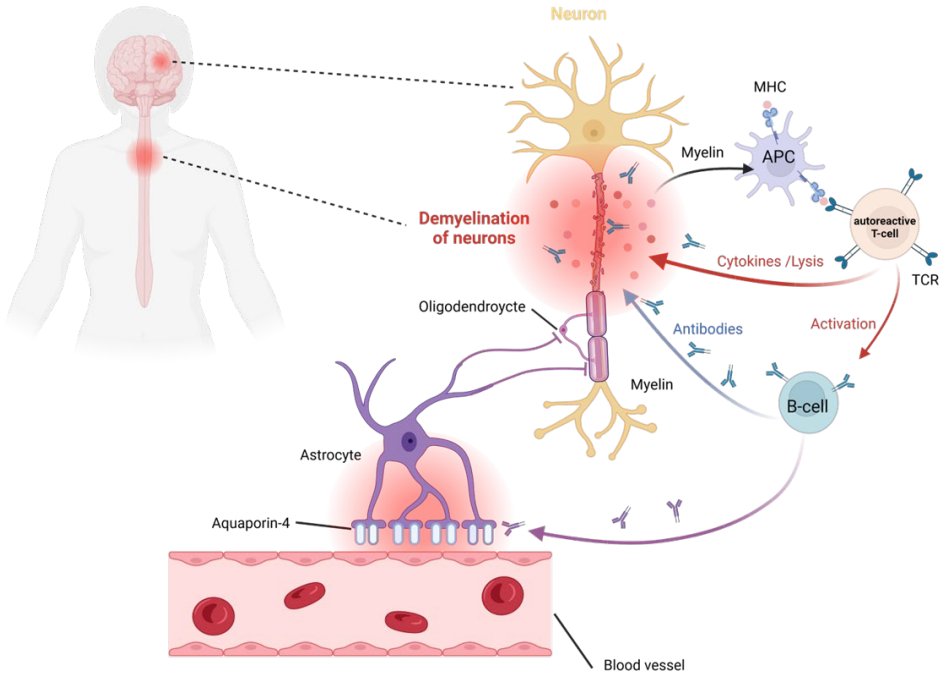
Image adapted from BioRender.com (2022)

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 1-5 per 100,000 people[1]

Entered into an R&D agreement with Massachusetts General Hospital (MGH) in Boston and Dr. Michael Levy, a worldwide leading NMOSD expert



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

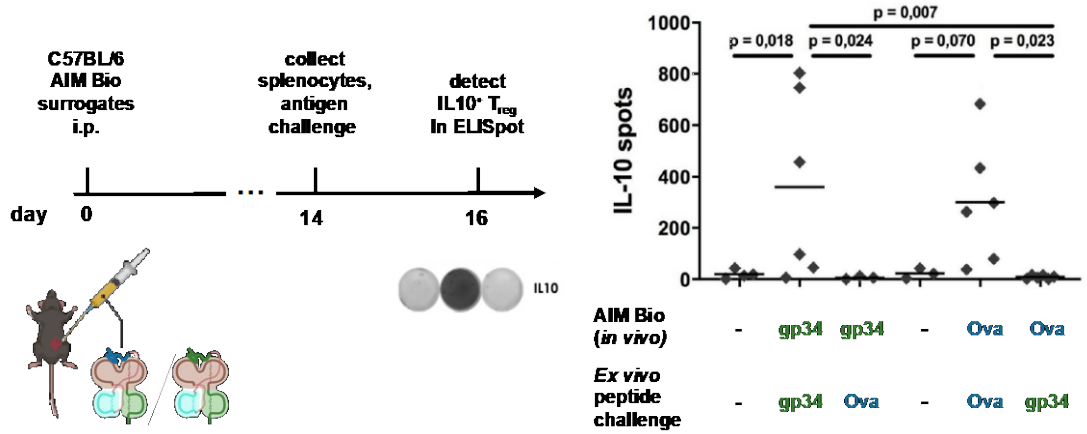
Next Steps:

- Completing comprehensive pre-clinical data package
- Scientific advice meeting with regulatory authorities expected Q3 2023

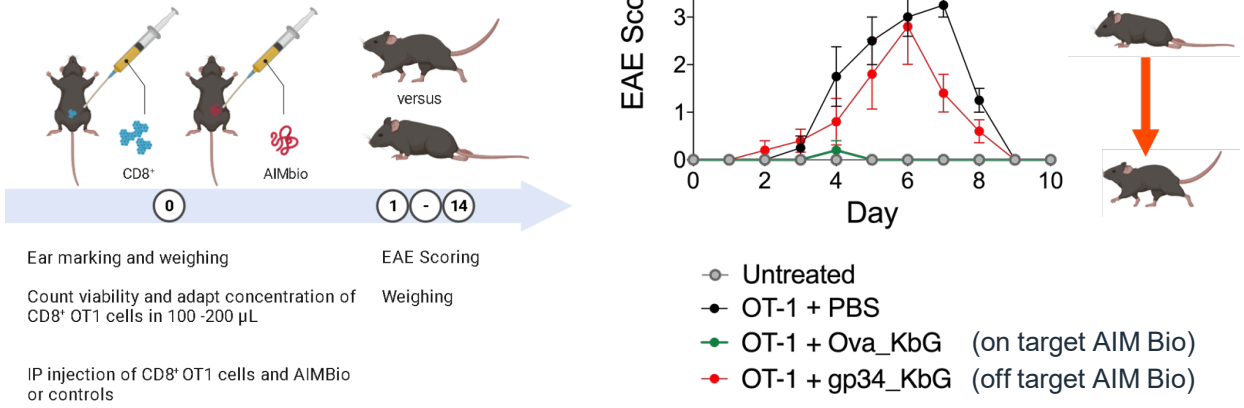
Image adapted from BioRender.com (2022)

Proof-of-Concept in NMOSD

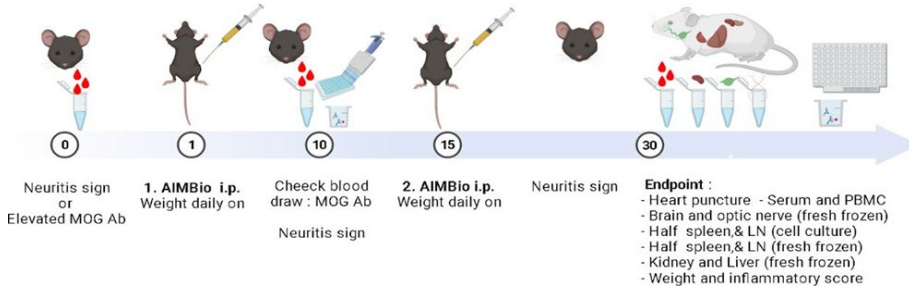
Surrogate AIM Bios induce antigen-specific CD8 T_{reg} *in-vivo*



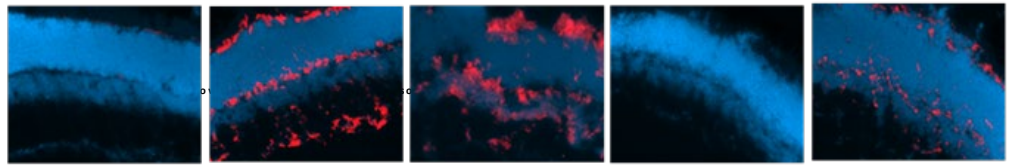
Preclinical proof-of-concept in the ODC-Ova OT-1 EAE model



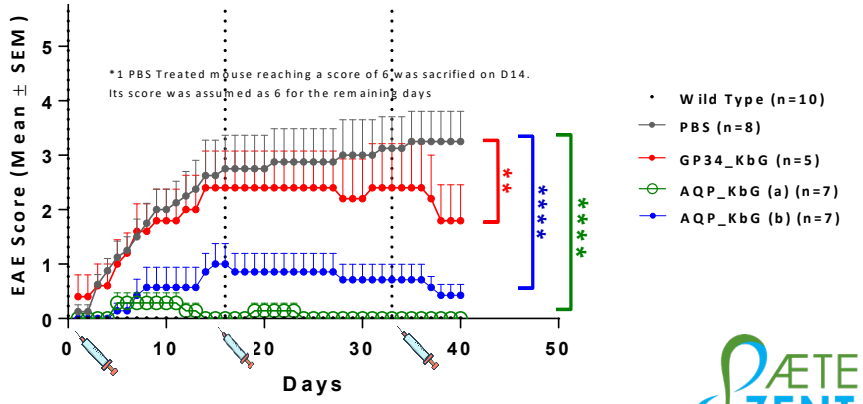
AQP4 surrogate AIM Bios prevent caspase 3 activation in the inner retinal layer and EAE in spontaneous 2D2 optic neuritis model



red = cleaved caspase 3



Wild-type | 2D2 + PBS | + gp34_K^bG | + AQP_K^bG (a) | + AQP_K^bG (b)



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

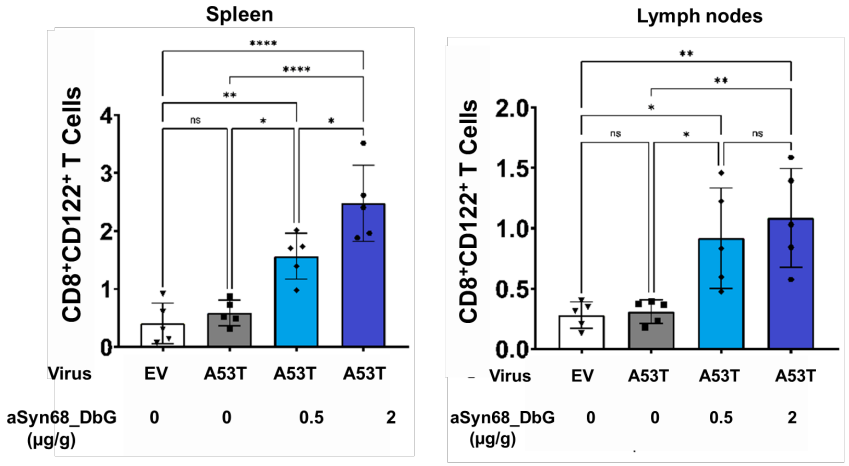
Next Steps:

- Completing comprehensive pre-clinical data package
- Scientific advice meeting with regulatory authorities expected Q3 2023

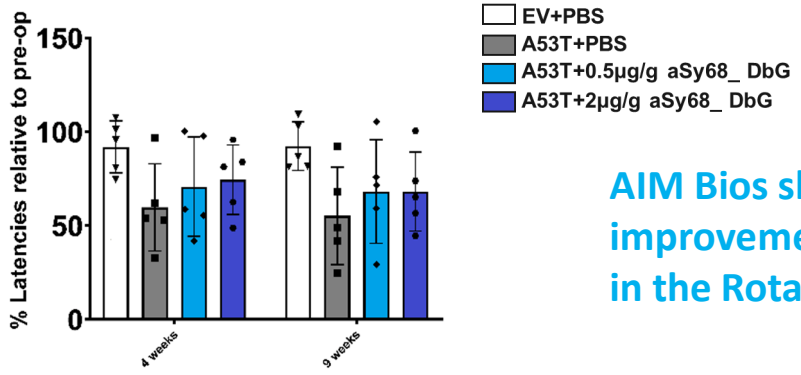
1: Bonam et al.; Autoimmunity Reviews 2020
2: World Health Organization. (n.d.). Parkinson disease. World Health Organization

Demonstrated Improvements in Preclinical Parkinson's Disease Model

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

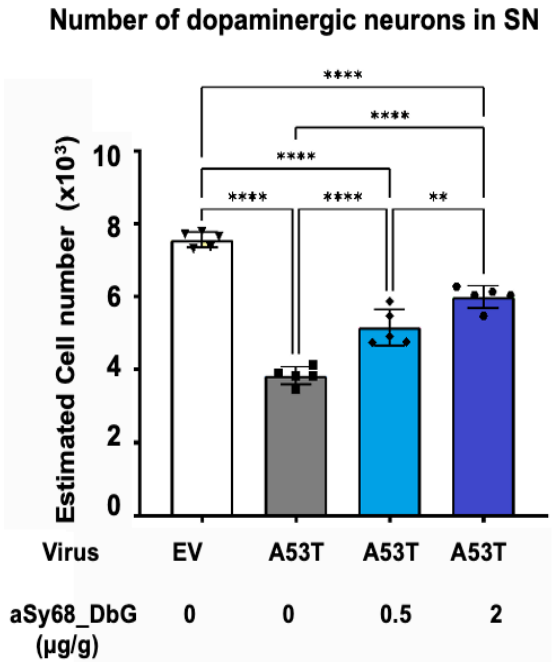


AIM Bios induce regulatory CD8+CD122+ T cells in spleen and lymph nodes



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

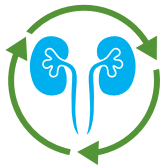
Significantly improves survival of SN neurons



AEZS-150

Delayed Clearance Parathyroid Hormone Fusion Polypeptides DC-PTH for the Treatment of Chronic 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 develop a self-administered pen to help maintain normal serum calcium and phosphate levels in a once weekly treatment versus current daily injections

Hypoparathyroidism

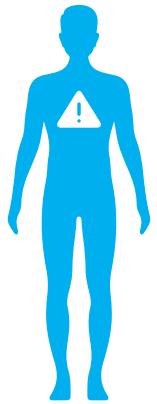
Body produces abnormally low levels of PTH

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

AEZS-150

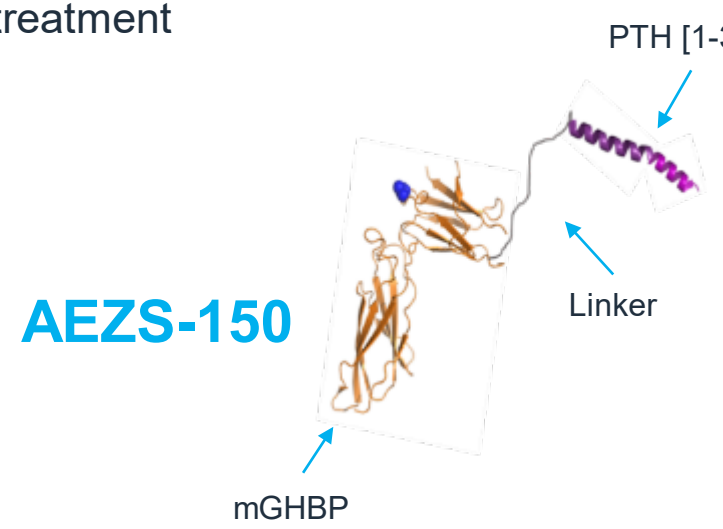
Delayed Clearance Parathyroid Hormone Fusion
Polypeptides DC-PTH for the Treatment of Chronic Hypoparathyroidism

Promising Preclinical Results

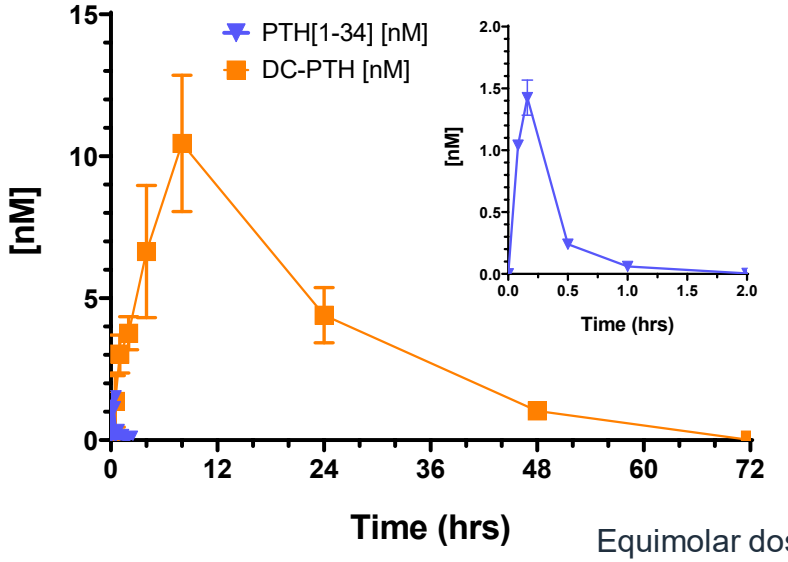
AEZS-150: Fusion-Protein of PTH [1-34] coupled via a linker to a modified growth-hormone binding protein (GHBP)[1]

Delayed clearance in comparison to PTH[1-34]

Potential to control serum calcium levels by once weekly treatment



Plasma Pharmacokinetics in a Rat Study[2]



Equimolar dosing of 20 nmol/kg

Next Steps:

- Progressing toward establishment of master cell bank and GMP manufacturing
- Planning to meet with regulatory authorities in mid-2023 to discuss best development path forward

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

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Macimorelin

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

Macimorelin for the Treatment of ALS

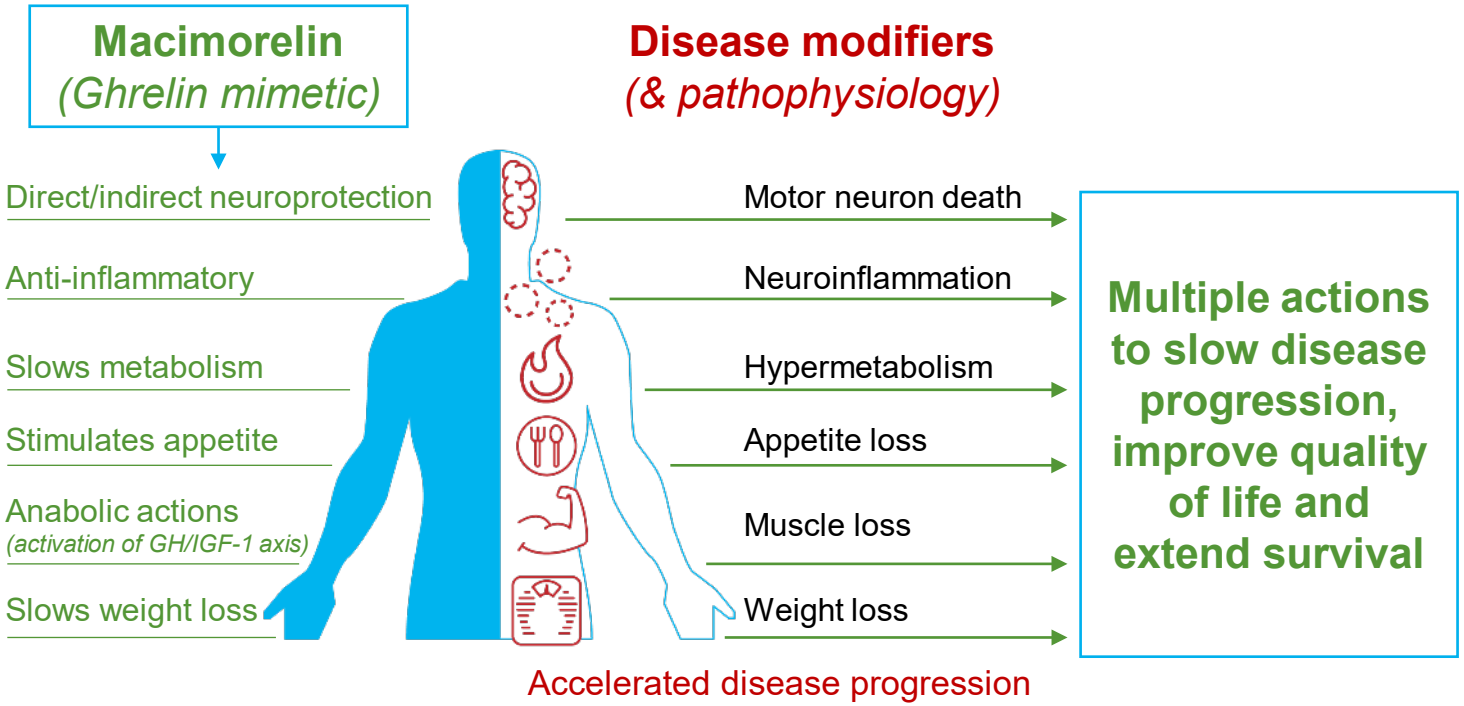
Importance of Ghrelin and the GH/IGF-1 axes in ALS[1]

- 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, improve muscle strength, and extend 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:

- Ongoing evaluation in transgenic mouse ALS models with results expected Q3 2023
- Following PoC studies, planning to meet with regulatory authorities to discuss best development path forward

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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Macimorelin / Macrilen™
First and Only AGHD Test Approved
by US FDA and European Commission

Macimorelin

Only Approved Oral Diagnostic for GHD

No Other FDA or EC Approved Specific Test for GHD

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

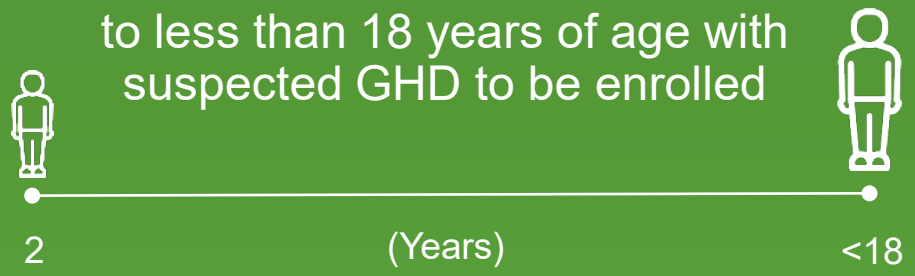
Pivotal Phase 3 DETECT[1] Study for Diagnosis of CGHD

Expect to Complete Enrollment by End of 2023

- Open-label, single dose, multicenter, multinational

  United States, Germany, Armenia, Poland, Greece, Georgia, Italy, Serbia, Romania, Slovakia, Slovenia, Turkey
- 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

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

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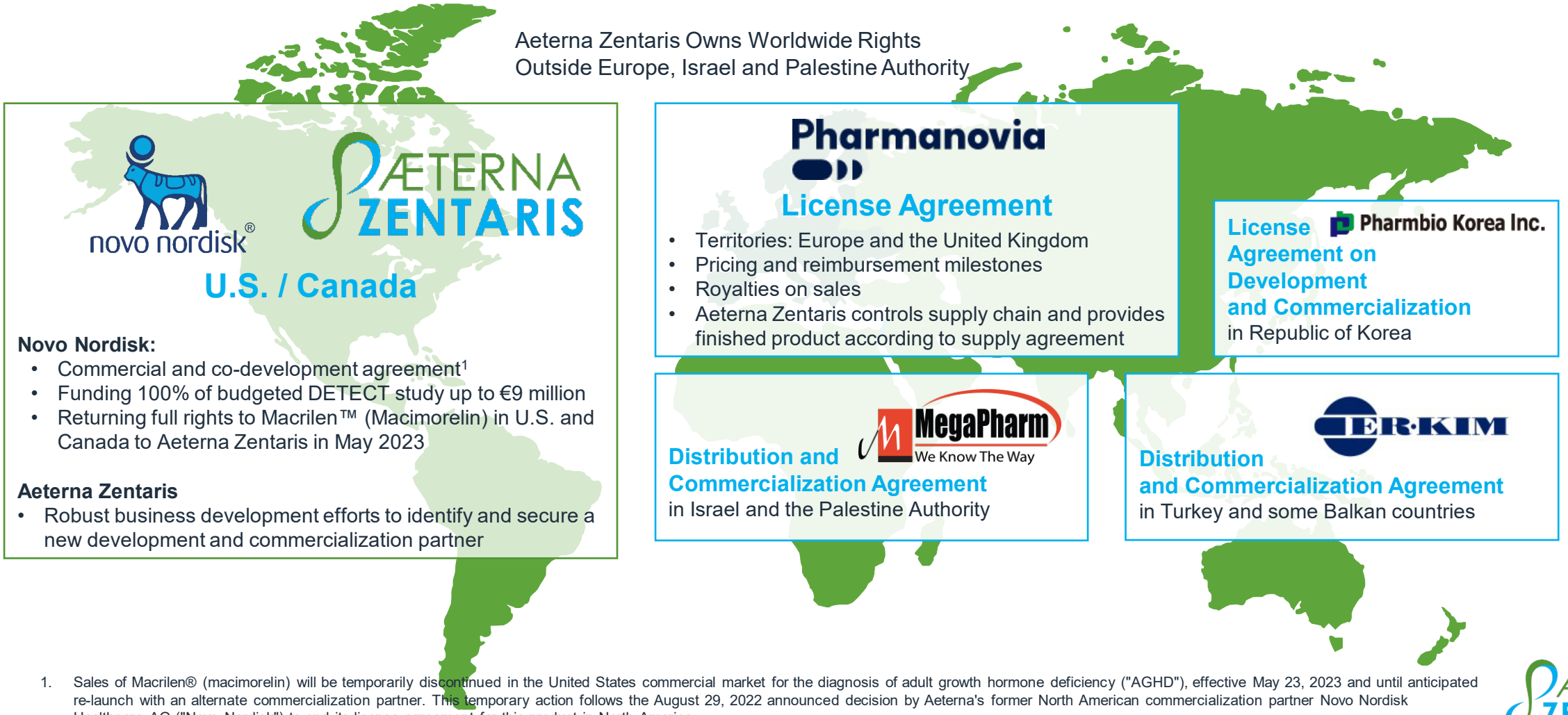
Macimorelin Commercial Rights

Actively seeking commercial partners in North America and ROW



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

novo nordisk®

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U.S. / Canada

Novo Nordisk:

- Commercial and co-development agreement[1]
- 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

Pharmanovia

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

Pharmbio Korea Inc.

Distribution and Commercialization Agreement in Israel and the Palestine Authority

MegaPharm
We Know The Way

Distribution and Commercialization Agreement in Turkey and some Balkan countries

ER·KIM

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Corporate Overview

Financial Snapshot

NASDAQ: AEZS / TSX: AEZS

Cash Runway Expected to Fund Operations Into 2025

~$46.6M	~$15M	~4.9M	~17K
Cash on Hand As of March 31, 2023	Market Cap[2]	Shares Outstanding[3]	3-Month Avg. Volume[4]

1: Based on Management's current expectations and planned development activities
2: Based on May 9, 2023 closing price of $3.10 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 May 9, 2023 for the 3-month 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

Developing and Commercializing a Diversified Portfolio of Pharmaceutical and Diagnostic Products

Therapeutic Development Programs

Targeting multiple high-value indications across areas of unmet need

Strategy focused on maximizing opportunities while conserving capital

Development and Commercial Diagnostics

AGHD

Only oral drug indicated for diagnosis of adult growth hormone deficiency

CGHD

Ongoing Phase 3 study with completion of enrollment expected year end 2023

Significant Cash Runway

Strong financial position with sufficient capital to fund operations and develop programs through 2024 and into 2025[1]

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

In Pursuit of Medical Innovations

Investor & Media Relations
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