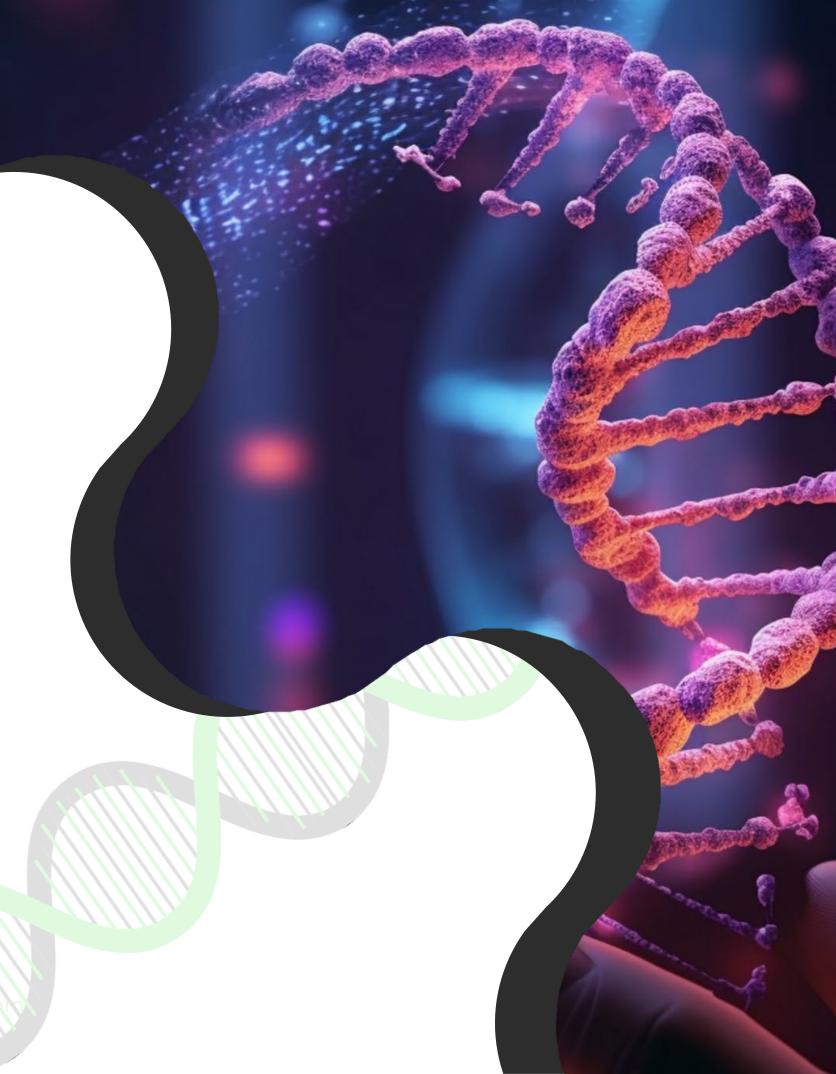


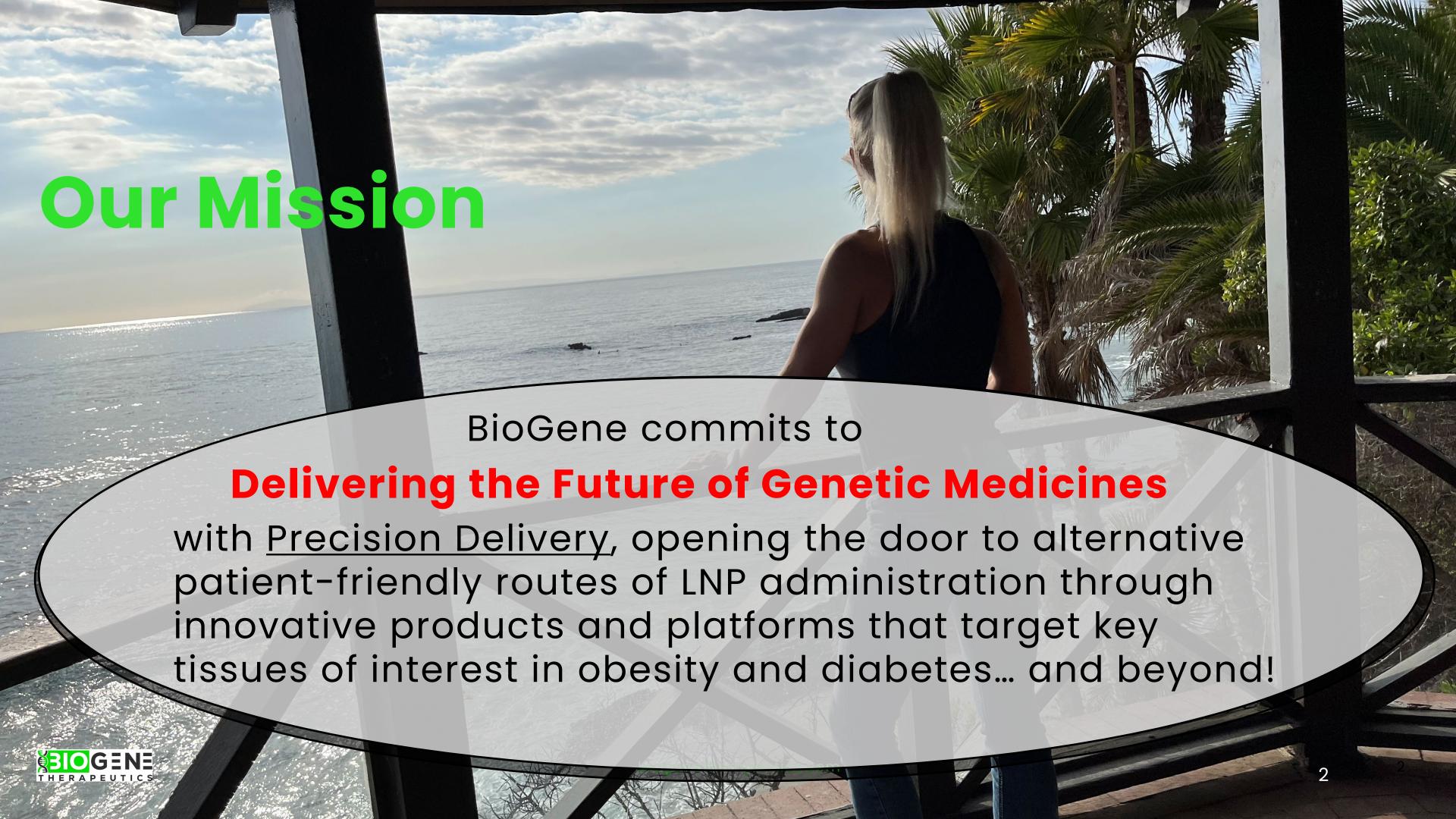


Q1- 2025

Investor Presentation







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Board of Directors



Stephen Van Deventer

Stephen is the

Chairman and CEO

of BioGene Therapeutics and

PreveCeutical Medical, with

extensive experience in capital markets with a focus on life sciences. Stephen has started and raised millions in the capital markets space.



Linnéa Olofsson, PhD

Linnéa is the **Chief Scientific Officer** at

BioGene

Therapeutics and sits on the board at

Preveceutical

Medical. Linnéa is an accomplished biophysicist with expertise in pharmacology, oncology, cell biology, molecular biology, and gene editing.



Deepak Sampath, PhD

Deepak will serve as
an Independent
Director for BioGene.
He is the Senior VP,
Head of Research at
Ultragenyx, with
previous experience
at Pfizer and
Genetech, along with
several patents in the

treatment of cancers.



Steve Glover

a Board Member,
bringing multifaceted
experience in Fortune
100 and start-up
environments. He sits
as Chairman and CEO
of Nasdaq-listed

ZyVersa Therapeutics and was former

Chairman of **Ambrx**, which was acquired for \$2B.



Patroski J. Lawson, MSP

Patroski is the founder and CEO of **KPM**

Group DC, a strategic

public affairs firm.
With over 20 years of
experience in
government affairs, he

has worked across local, state, federal, and global levels,

Solvay
Pharmaceuticals,
Abbott, and

including roles at

Lundbeck.



Scientific and Corporate Advisory Board



Prof. Mirela Delibegovic

As a member of
BioGene's Scientific
Advisory Board,
Mirela brings a wealth
of knowledge in
metabolic physiology
with a focus on
diabetes, obesity and
CVD. Prof Mirela holds
the prestigious Regius
Chair of Physiology
at The University of
Aberdeen, UK.



Barry Ticho, MD, PhD

Barry will serve on
BioGene's Scientific
Advisory Board.
Barry holds several
prestigious roles as
Founder and Board
Member at Verve
Therapeutics,
Cardior
Pharmaceuticals,
Sania Therapeutics
and Stoke
Therapeutics.



Brian Gallagher, Jr.

Corporate Advisory
Board bringing
critical investment
experience within
the life sciences
sector raising capital
through various
channels including
the Michigan
Biomedical Venture
Fund, Slate Bio and
Trek Ventures.



Kathy Rokita

Corporate Advisory
Board and currently is a Managing Director at
CBIZ and has provided consulting services for physician groups and healthcare organizations for over 30 years. She has had successful exits, most notably as a Principal at Somerset CPAs.



Senior Management



Stephen Van Deventer





Kim Van DeventerHead of HR and
Administration.





Mariya Georgieva, PhD

Mariya has been appointed as **President** of BioGene. Over the past 5 years, Mariya has worked with AstraZeneca, Mariya has worked with **AstraZeneca** initially as a Director of Diagnostic Alliances and later Director of Precision Medicine. She has expertise in molecular biology, digital pathology and strategic partnering



Harry Parekh, PhD

Harry is welcomed to the BioGene team as Chief Research Officer & Scientific Founder of BioGene. Harry is currently a Director of Research

and Research Group

Leader at the
University of
Queensland,
Australia. He also
serves as CRO &
Scientific Founder
for PreveCeutical
Medical.



Alex McAuly, CPA

Serves as the **CFO** for BioGene. Alex is a Chartered Professional Accountant of Canada with vast experience in running publicly traded companies through his astute knowledge of accounting principles in North America and Europe.



Louis Lapointe

Business
Development for
BioGene bringing
decades of
experience and
execution. He will
lead the team in
discovering revenue
generating business
channels and key
strategic
partnerships.

BIOGENE AUSTRALIA

BioGene has established a wholly-owned subsidiary in Brisbane, Queensland, Australia, to bolster their research and development interests and provide significant cash-back R&D grants from the Australian government.

Brisbane hosts a series of globally-renowned research, manufacturing and clinical trial facilities.

BioGene to receive <u>43.5%</u> cash back from Australian Federal Government on all R&D, clinical trial and operational costs.











Children's Health Queensland



R&D Formulation & Preclinical Facility



GMP Manufacturing Facility





Metro South Health

A Global Epidemic



OBESITY

Cases have tripled in the past decade leading to elevated risk of mortality: heart disease, stroke and dementia.

DIABETES

1 in 10 adults are diagnosed with diabetes. Childhood rates of diabetes & obesity are on a steep upward trajectory.

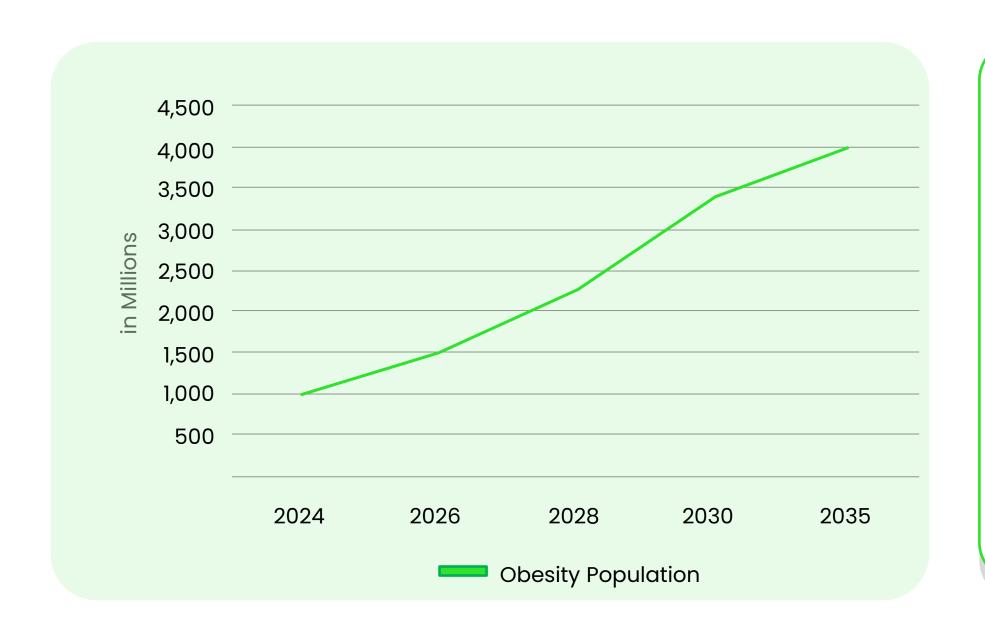
DRUG SIDE EFFECTS

Debilitating and even life-threatening side affects have emerged with current marketed weight-loss treatments.



Obesity Rates

Obesity Cases Triple in a Decade



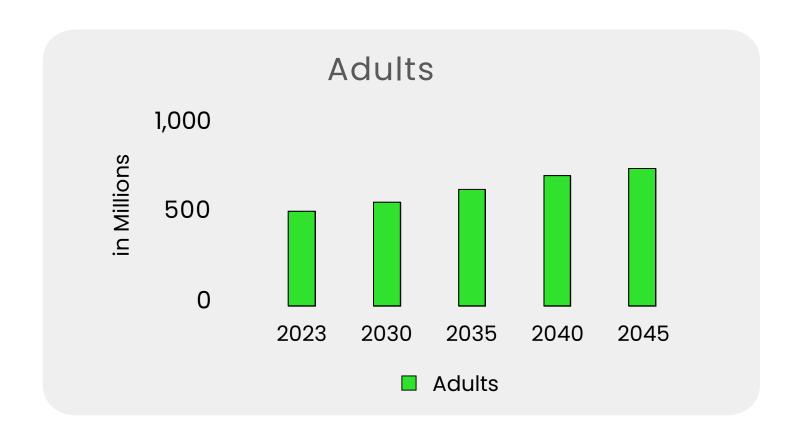
- The World Obesity Federation (WOF) predicts that despite current treatments the economic impact of obesity will reach >\$4 trillion annually by 2035.
- WOF report predicts that by 2035, **>HALF** of the world's population (>>4 billion people!), will be classified as "obese".
- Childhood obesity cases are anticipated to impact >200 million boys and >170 million girls by 2035.

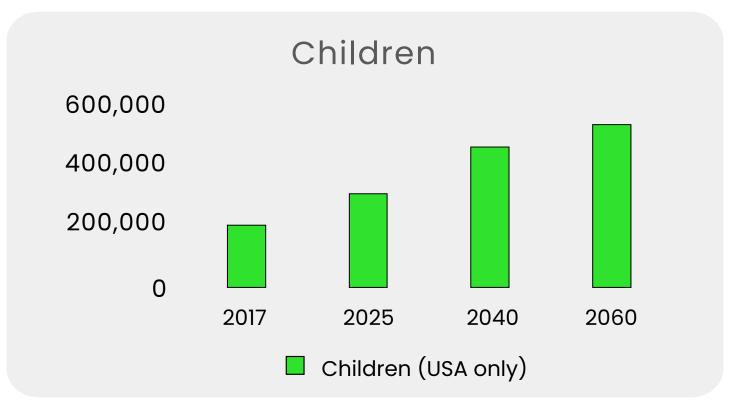
www.mordorintelligence.com/industry-reports/weight-loss-diabetes-drug-market



Diabetes Rates

1 in 8 Adults are Diabetic and Children Rates Rapidly Rise





- Leads to >4 million adult deaths a year.
- Over 570 million adults aged between 20 and 79 years are <u>currently</u> living with diabetes.
- Projections indicate >640 million cases by 2030, increasing by over 20% to >780 million by 2045.
- Childhood rates of diabetes continue to rise at alarming rates!

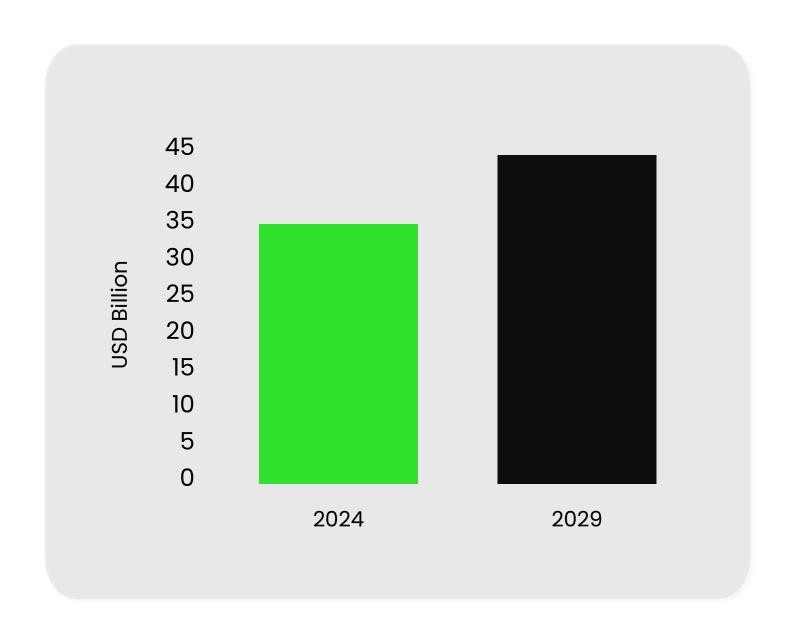
https://www.diabetesdefa.org/assets/image/global-diabetes-epidemic-projected-growth-cases-2030-and-2045; https://diabetesatlas.org/data/en/; https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10101827/



Weight Loss Drug Market

\$200Bn in the Next Decade

- The weight loss drug market was *circa*. US\$34 billion in 2024.
- Expected to surpass US\$43 billion by 2029
 (CAGR >5.5%, 2024-29)
- Barclays capital markets projects a US\$200 billion market by *circa*. 2030.



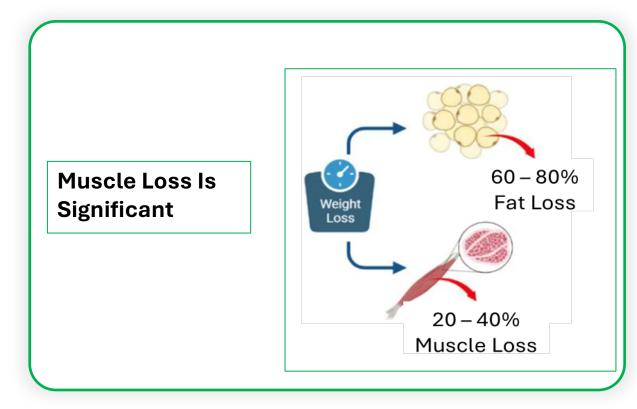
https://www.mordorintelligence.com/industry-reports/weight-loss-diabetes-drug-market https://www.cnbc.com/2023/04/28/obesity-drugs-to-be-worth-200-billion-in-next-10-years-barclays-says.html



GLP1 agonists have changed the obesity treatment paradigm but unmet medical needs remain high

Present with an array of issues:

- Severe sometimes life-threatening side effects
 - 40% of patients stop treatment by one year
- 20-40% muscle loss
- Patients build tolerance over time
- Doesn't restore metabolic functions
 - Rebound or on it for life (if tolerated...)
- Injections are painful, inconvenient
- Oral route real world challenges w.r.t dosing and bioavailability due to poor diet of target population







BioGene's solution

Dual Gene Therapy siRNAs targeting obesity and diabetes -> restores metabolic functions with reduced side effects, increased compliance and cost-effectiveness

SOL-GEL PLATFORM

A versatile platform revolutionizing Nose-to-Brain (N2B) delivery of therapeutics with global patents pending

BIORESPONSIVE LNP PLATFORM

Bioresponsive selfassembling lipid nanoparticle (bLNP) platform technology effectively delivering and releasing genetic cargo

US Patent GRANTED

Smart-siRNAs

Metabolicallystabilised and multiple exon targeting siRNAs specifically against PTP1B, validated

DUAL GENE THERAPY

Smart-siRNAs targeting
PTP1B delivered using our
bLNP platform directly
N2B with Sol-Gel, in an
easy to use nasal spray
format



SOL-GEL Nose To Brain Platform Delivery



Challenges with Oral Delivery Route

Rapid breakdown by enzymes in the gut.
Increasing incidence of GI distress from oral dosing of medication complicated by poor diet. Low bioavailability.



Direct Nose-to-Brain Delivery

Desired patient outcomes are achieved by <u>consistent</u> and <u>sustained delivery to</u> the whole brain, dose after <u>dose</u>.



The Blood-Brain-Barrier

BBB remains a universal hurdle for drugs intended for the brain when administered via conventional routes (oral, injection), which we altogether circumvent.



Olfactory Pathway Targeting with Sol-Gel

An ideal and proven pathway for rapid, direct and sustained brain delivery of therapeutic cargo, via our patient-friendly nasal spray Sol-Gel platform.



What is the Sol-Gel Platform?

A *solution* that is engineered to rapidly *gel* upon contact with mucosa...

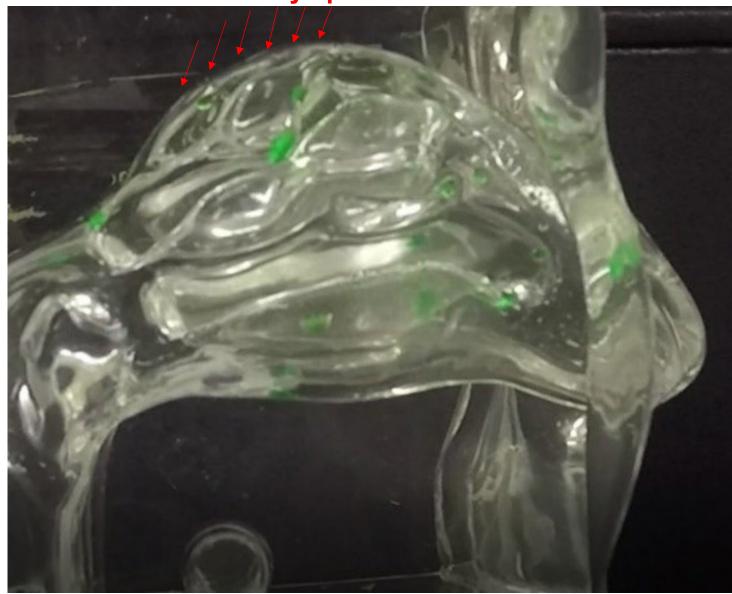
- Targeted spray delivery and retention on mucosa
- Controlled and sustained release (nanomicellar-formulation) to and through mucosa
- Sol-Gel delivery altogether circumvents the BBB not a hurdle for BioGene!

Solution state permits spraying via devices and extensive/uniform tissue coverage Body Temperature Mucoadhesive functional gel promotes sustained & controlled delivery



SOL-GEL Platform Technology & Device

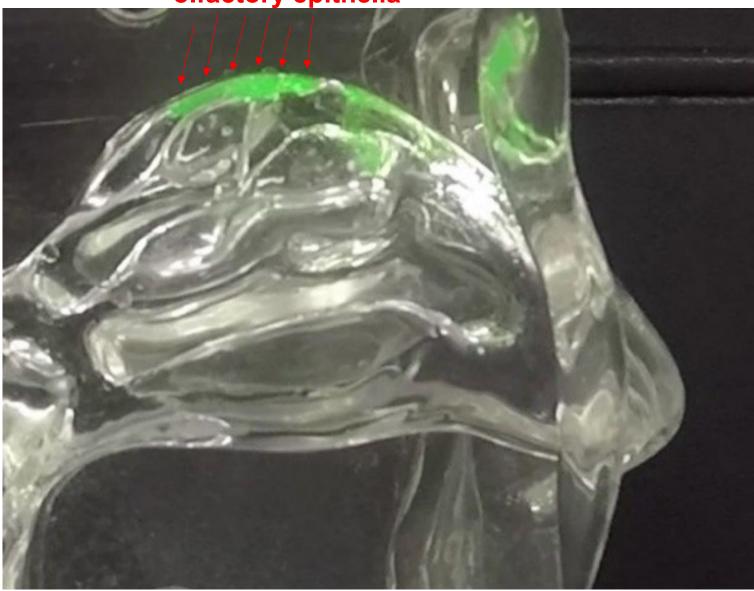
olfactory epithelia



Conventional nasal sprays deliver formulation throughout the nasal cavity, and are rapidly cleared...

- Anterior & posterior leakage
- Rapid ciliary clearance
- Poor retention
- Unpredictable transmucosal delivery to trigeminal nerves

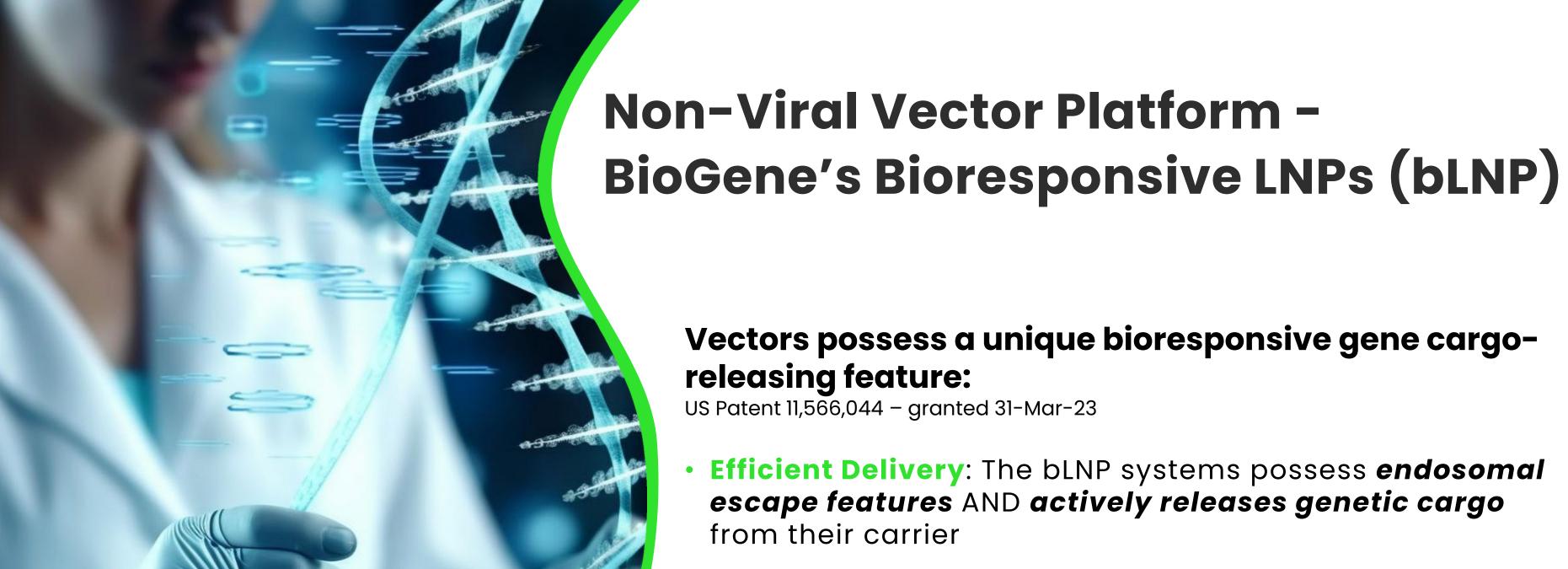




Olfactory mucosa targeting, rapid sol-to-gel transition, muco-retention and sustained delivery

- **Exclusive** olfactory targeting
- Direct, rapid nose-to-brain delivery
- Mucoadhesive sol-gel provides for sustained & controlled delivery
- Patient-friendly water or buffer vehicle **no** alcohols or oils





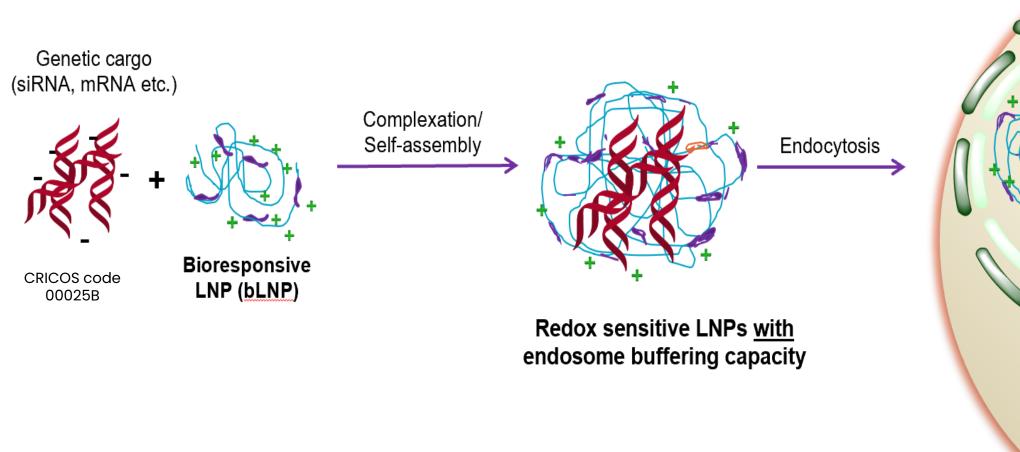
Vectors possess a unique bioresponsive gene cargo-

- Efficient Delivery: The bLNP systems possess endosomal escape features AND actively releases genetic cargo
- Low Toxicity: Non-viral, self-assembling bio-inspired patented bLNPs that employ naturally-derived building blocks
- Cost-effective: Synthesized using robust, scalable, wellestablished chemistries at high yield



Key features of BioGene's Bioresponsive LNPs (bLNP)

- Next generation non-viral bioresponsive vector
- US Patent # 11,566,044 granted, 31st March 2023



Cytosol Endosomal buffering by bLNPs leading to endosome rupture 'Free' genetic cargo Active dissociation of genetic cargo from **bLNP**

Cell

Comprehensive release of **all** genetic cargo from their carrier...

Significant implications for precision medicine in **mainstream** disease re: dosing, pricing and patient accessibility...

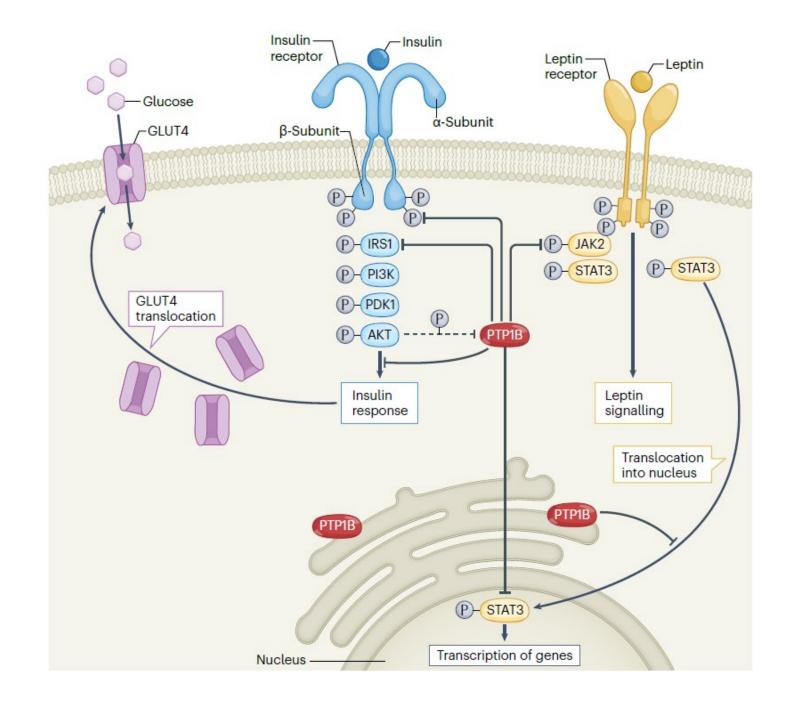


PTP1B Validation: Diabetes (Insulin resistance) & Obesity (leptin signaling)

PTP1B directly dephopshorylates the Insulin Receptor while indirectly acting on the leptin receptor to regulate satiety through Jak2/Stat3.

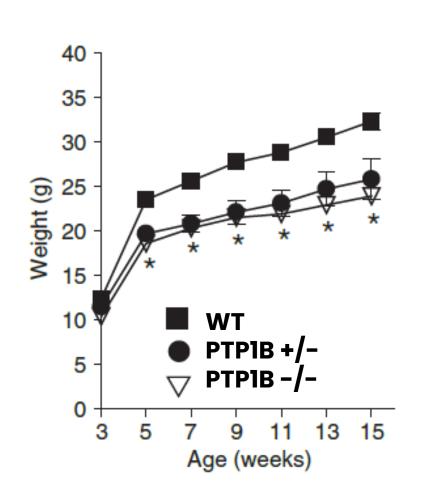
Dual approach: our bLNPs specifically targeting PTP1B has been uniquely designed with lipids with both anti-inflammatory and direct PTP1B inhibition properties

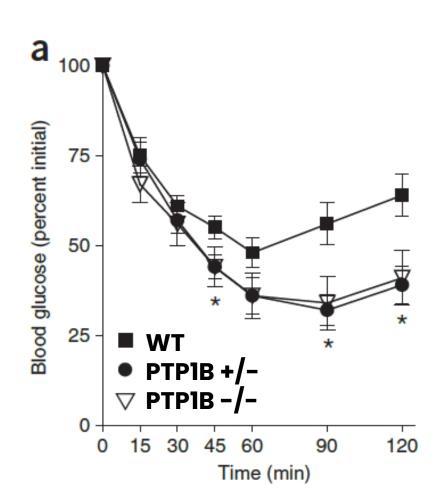
50% reduction in PTP1B deemed adequate to restore metabolic homeostasis.

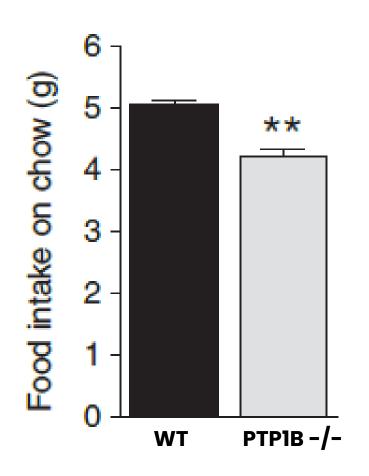


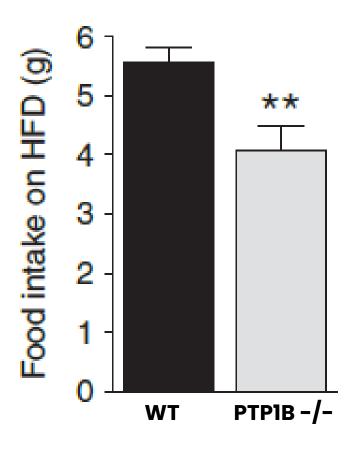


Mice lacking neuronal PTP1B are resistant to diet induced obesity and are protected from developing leptin resistance









Neuronal PTP1B regulates body weight, adiposity and leptin action

Kendra K Bence^{1,4}, Mirela Delibegovic¹, Bingzhong Xue², Cem Z Gorgun³, Gokhan S Hotamisligil³, Benjamin G Neel¹ & Barbara B Kahn²

njamin G Neel¹ & Barbara B Kahn²



NATURE MEDICINE VOLUME 12 | NUMBER 8 | AUGUST 2006

Conclusion of the study: "for effective obesity treatment and optimal therapy for type 2 diabetes, PTP1B inhibitors must be directed to the brain"

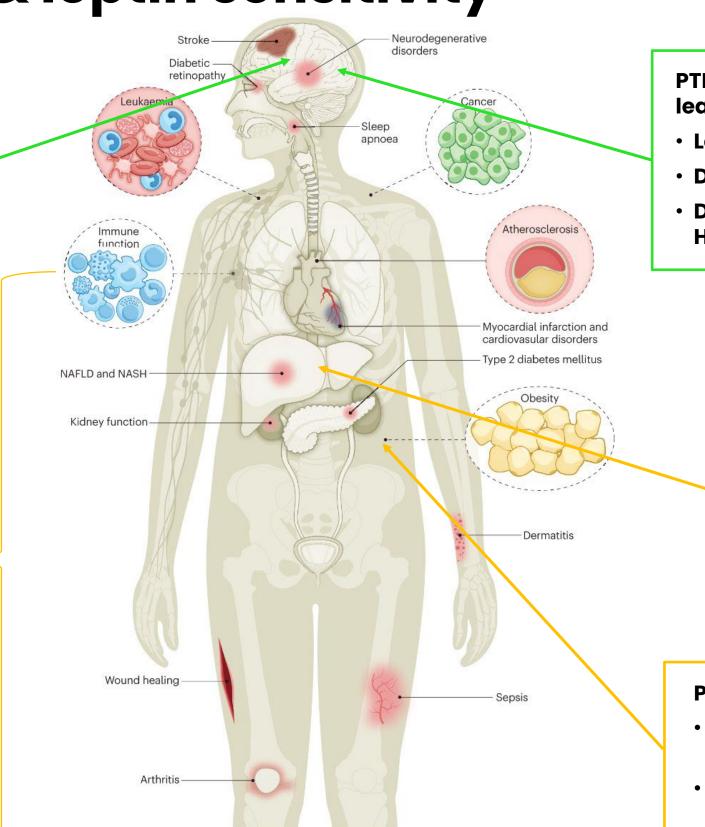
Preclinical development; downregulating PTP1B in the CNS only, restores <u>both</u> insulin & leptin sensitivity

Neuron-specific PTP1B -/- leads to

- Decrease in body weight & fat mass
- Increased activity and energy expenditure
- Increased leptin secretion
- Improved glucose homeostasis.

PTP1B -/- in skeletal muscle leads to

- Body weight effect similar to WT
- Improved glucose insulin sensitivity



PTP1B -/- in leptin-receptor expressing neurons leads to

- Leptin hypersensitivity
- Decrease in body weight & fat mass
- Decreased body weight & fat mass gain upon HFD-feeding compared to WT

PTP1B -/- in liver leads to

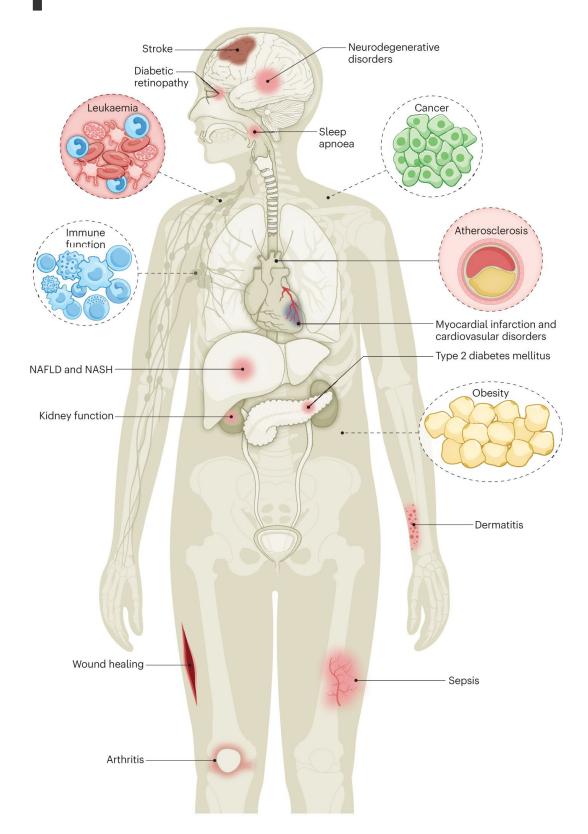
- No effect on body weight.
- Decreased gluconeogenesis and plasma lipid levels
- Protective against HFD-induced inflammation and ER-stress.

PTP1B -/- in adipose leads to

- Potential to increased body weight, enlarge adipocytes and impair insulin sensitivity
- Protection against atherosclerosis



PTP1B is a strong drug target candidate for obesity, T2D and other therapeutic areas



PTP1B inhibition reduces neuroinflammation and fronto-temporal dementia in animal models displaying potential for the treatment of **Alzheimer**

Source: Pharmacological PTP1B inhibition rescues motor learning, neuroinflammation, and hyperglycaemia in a mouse model of Alzheimer's disease, Franklin et al, Exp Neurology, 2024

PTP1B inhibition has been demonstrated to enhance anti-tumor immunity and combat solid-state cancer

Source: A small molecule inhibitor of PTP1B and PTPN2 enhances T cell anti-tumor immunity, Liang et al, Nat Comm, 2023

Ongoing clinical trials:

- PTP1B Implication in the Vascular Dysfunction Associated With
 Obstructive Sleep Apnea, Angers, France (NCT04235023)
- Correlation Between PTP1B Expression and Organ Failure
 During Sepsis, Univ Hospital Rouen, France (NCT03189355)
- MSI1436 PTP1B inhibitor for **metastatic breast cancer**



PTPN1 Gene Targeting Strategy with BioGene's Smart-siRNAs

PTPN1 gene comprises 10 exons, each potential targets for siRNA:

1 63bp 2 91bp 3 101bp **4** 99bp

5 138bp

6 210bp **7** 162bp 8 224bp 9 196bp **10** 24bp

01.

Successfully engineered selective, potent siRNAs independently targeting multiple exons of *PTPN1*

02.

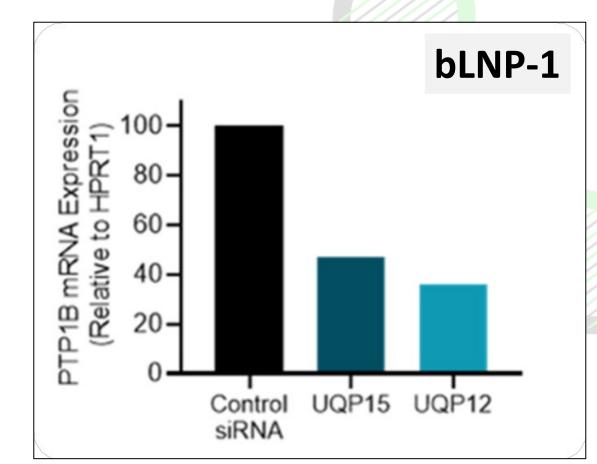
siRNAs against both mouse and human variants of distinct exons were engineered in parallel, paving the way for PoC preclinical and clinical studies 03.

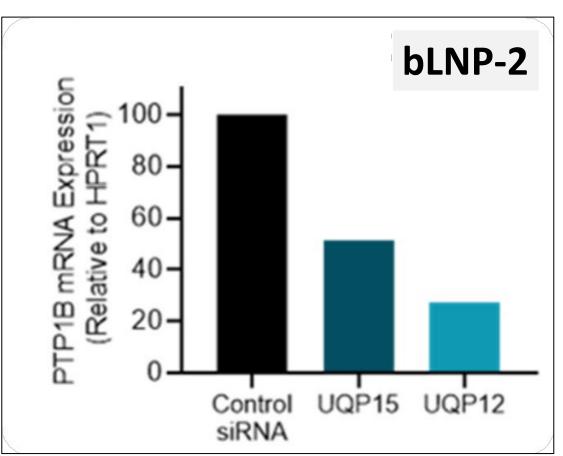
siRNAs sequences were engineered to be biostable ('SmartsiRNAs'), and novel w.r.t the prior art/published sequences



Potent Gene Silencing Confirmed Using BioGene's Bioresponsive LNPs (bLNPs)

- bLNPs possess the unique bioresponsive 'genereleasing' linker (US Patent #11,566,044 – granted 31/Mar/23)
- UQP12 & UQP15 (top and bottom graphs) represent select Smart-siRNAs showing potent gene silencing when formulated with two distinct bLNPs.
- UQP12 & UQP15 represent only two uniquely designed metabolically-stablized siRNAs from our extensive library that display potent gene & protein silencing.







Planned Diabetes and Obesity Preclinical Study

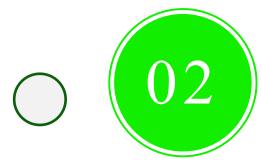
The study will evaluate BioGene's SmartsiRNAs versus conventional constructs using bioresponsive LNP formulations in rodent models of diabetes and obesity.

The study design includes mice cohorts for robust statistical analysis, appropriate control groups, and comparison of administration routes.

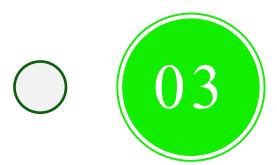


Location: The University of Queensland, Brisbane

→ Extensive expertise with Sol-Gel engineering, bLNP formulation & preclinical models of obesity and diabetes



Research Team Led by BioGene's Chief Research Officer & Scientific Founder, Dr. Harry Parekh.



Objectives: Assess weight changes, PTP-1B levels in major tissues, tissue histology, and classical blood and urine biomarkers (e.g. glucose, triglycerides) throughout the extended treatment period.



Success Criteria: Weight reduction; Restoration of glucose levels/insulin sensitivity, increased activity, and improved behavioral patterns in diabetic and obese mice.



Timeline

Q1 2025

Commence preclinical PoC diabetes and obesity study with Smart-siRNAs & bLNPs in Sol-Gel



Announce topline data for preclinical study



Pre-clinical rodent diabetes & obesity trial concludes



Partnership
negotiations and
clinical trial
planning
gets underway



BioGene's solution

Dual Gene Therapy siRNAs targeting obesity and diabetes -> restores metabolic functions with reduced side effects, increased compliance and cost-effectiveness

SOL-GEL PLATFORM

A versatile platform revolutionizing Nose-to-Brain delivery of therapeutics with global patents pending

BIORESPONSIVE LNP PLATFORM

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US Patent GRANTED

Smart-siRNAs

Metabolicallystabilised and multiple exon targeting siRNAs specifically against PTP1B, validated

DUAL GENE THERAPY

Smart-siRNAs targeting
PTP1B delivered using our
bLNP platform directly
N2B with Sol-Gel, in an
easy to use nasal spray
format



Accessing non-dilutive funding from the Australian Medical Research Future Fund (MRFF) grant scheme

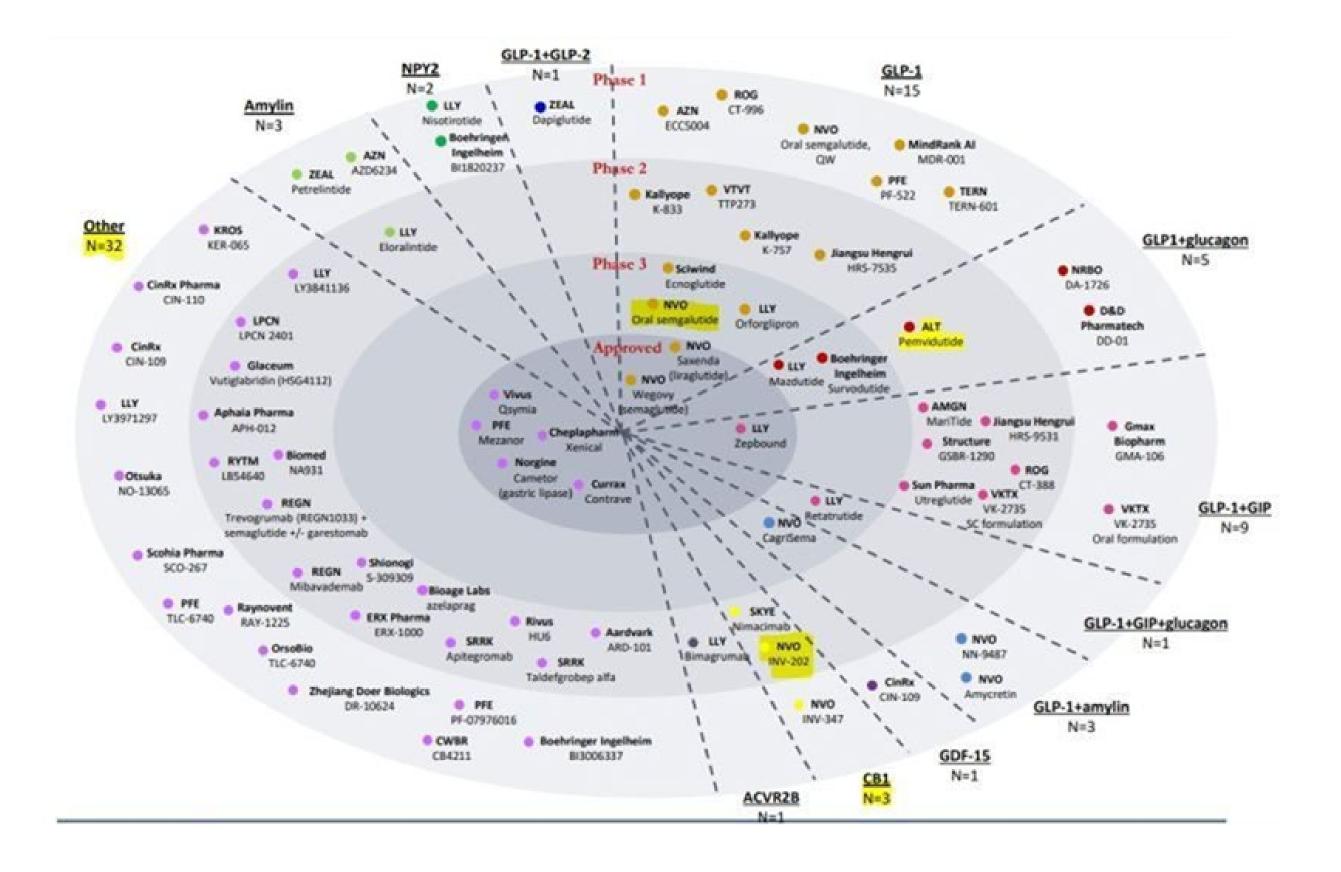
- The Medical Research Future Fund (MRFF)
 is a \$20 billion long-term investment
 supporting Australian health and
 medical research
- The MRFF aims to transform health and medical research and innovation to improve lives, build the economy and contribute to health system sustainability
- MRFF grant applicants are encouraged to have industry support (cash & in-kind)....

'Research Translation' is one of 4 main priority themes:

- Examples grant call typically for preclinicalthru-clinical trials
- Funding of innovation programs that deliver a 'moonshot' by creating a treatment for a currently serious and incurable health condition, through a series of linked projects
- Develop novel health technologies and/or re-purpose existing health technologies in a novel way - BioGene is a perfect fit!
- Max funding per application: AUD 25 million for up to 5 years

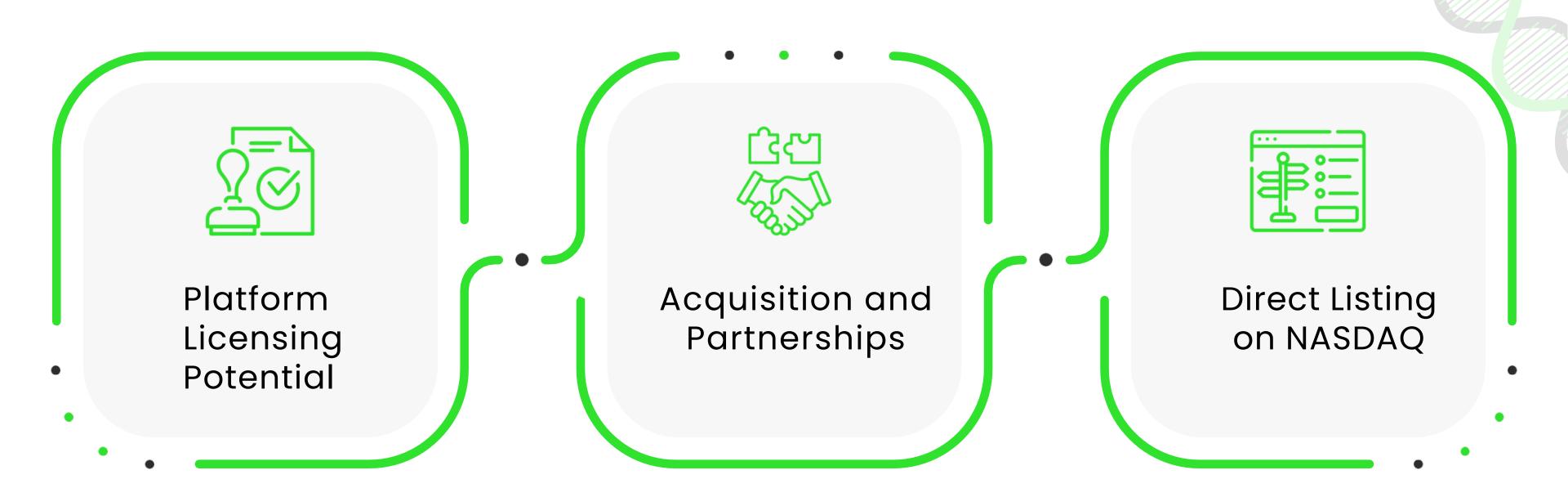


The Landscape is Rapidly Evolving to Next Generation Therapies





Revenue and Corporate Strategy





Global Collaborators











Thank You



PreveCeutical Medical Inc.

CSE:PREV | OTC:PRVCF | FSE:18 H

Contact Page



<u>ir@biogenetherapeutics.com</u>



biogenetherapeutics.com



Source



pubs.acs.org/CR

Type 2 Diabetes Mellitus: Limitations of Conventional Therapies and ntervention with Nucleic Acid-Based Therapeutics

Ganesh R. Kokil, Rakesh N. Veedu, *. 7.8. Grant A. Ramm, J. Johannes B. Prins, V nd Harendra S. Parekh*,

Peptide Science Research Article (wileyonlinelibrary.com) DOI 10.1002/psc.1347

Low-generation asymmetric dendrimers exhibit minimal toxicity and effectively complex DNA

Neha Shah, a,b Raymond J. Steptoeb* and Harendra S. Parekha*

J. Phys. Chem. B 2010, 114, 9231-9237

Structure and Dynamics of Multiple Cationic Vectors—siRNA Complexation by All-Ato **Molecular Dynamics Simulations**

Defang Ouyang,† Hong Zhang,† Harendra S. Parekh,*,† and Sean C. Smith*,†

School of Pharmacy and Centre for Computational Molecular Science, Australian Institute of Bioenginee and Nanotechnology, The University of Queensland, Brisbane, QLD 4072, Australia

Received: December 17, 2009; Revised Manuscript Received: June 1, 2010







Research Article 🙃 Full Access

Low-generation asymmetric dendrimers exhibit minimal toxicit and effectively complex DNA

Neha Shah, Raymond J. Steptoe X, Harendra S. Parekh X

First published: 24 February 2011 | https://doi.org/10.1002/psc.1347 | Citations: 46

Pharm Res (2014) 31:3150-3160 DOI 10.1007/s11095-014-1408-1

RESEARCH ARTICLE

Asymmetric Peptide Dendrimers are Effective for Antibody-Mediated Delivery of Diverse Payloads to in Vitro and in Vivo

SCIENTIFIC REPORTS

Received: 29 August 2017 Accepted: 12 February 2018 Published online: 19 March 2018

OPEN Self-assembling asymmetric peptide-dendrimer micelles - a platform for effective and versatile in vitro nucleic acid delivery

Ganesh R. Kokil¹. Rakesh N. Veedu^{2,3,4}. Bao Tri Le^{2,3}. Grant A. Ramm^{5,6} & Harendra S. Parekh¹

ADVANCED THEORY AND SIMULATIONS

Cell Membrane Penetration without Pore Formation: Chameleonic Properties of Dendrimers in Response to Hydrophobic and Hydrophilic Environments

Sergio de Luca, Prasenjit Seal 🔀, Harendra S. Parekh, Karnaker R. Tupally, Sean C. Smith 🔀

First published: 03 June 2020 | https://doi.org/10.1002/adts.201900152



pubs.acs.org/journal/abseba

Express in Vitro Plasmid Transfection Achieved with 16⁺ Asymmetric **Peptide Dendrimers**

Prarthana V. Rewatkar, David P. Sester, Harendra S. Parekh, and Marie-Odile Parat*

School of Pharmacy, The University of Queensland, 20 Cornwall Street, Woolloongabba, Queensland 4102, Australia ⁸School of Chemistry and Molecular Biosciences, The University of Queensland, Brisbane, Queensland 4072, Australia

Supporting Information



Sources

- 1.<u>https://www.mayoclinic.org/drugs-supplements/semaglutide-subcutaneous-route/side-effects/drg-20406730?p=1</u>
- 1.<u>cnbc.com Obesity drug industry could be worth \$200 billion within the decade, says Barclays</u>
- 1. <u>news.harvard.edu Are new weight-loss drugs the answer to America's obesity problem?</u>
- 1.zs.com Pharma needs a commercial model that can solve it
- 1. msn.com Obesity drug industry could be worth \$200 billion within the decade, says Barclays

