Visgenx, Inc

Pioneering Ocular Gene Therapy for Eye Disorders

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Poster ID #

CELL & GENE THERAPY ADVANCING NEXT GENERATION THERAPIES WEST COAST SYMPOSIUM

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Company Overview

Visgenx is developing gene therapies utilizing two distinct platforms. The ELOVL2 platform capitalizes on ELOVL2's crucial role in retina and tissue health. It's epigenetic decline in expression with age may underlie disorders like dry-AMD, Alzheimer's, and Diabetes. Notably, our leading product, AAV8-ELOVL2 gene therapy, targets dry-AMD.

Our second platform focuses on synthetic AAV genomes for gene delivery. These genomes ensure durable expression without payload or immunogenic limitations. Notably, our synthetic AAV genome facilitated a full-length ABCA4 construct for Stargardt's Macular Dystrophy and has broader gene delivery applications.

The Problem

AAV-mediated gene delivery has many benefits. However, it also presents significant challenges limiting its utility including:

- **Immunogenicity Concerns**: The capsid's immunogenic nature can trigger inflammation.
- **Neutralizing Antibodies**: Pre-existing neutralizing antibodies can hinder successful AAV-mediated gene delivery.
- **Payload Constraints**: AAV's constrained payload size (4.7 Kb) limits its ability to accommodate larger therapeutic genes.
- **Non-Redosable**: AAV's limited redosability restricts re-administration.
- **Inflexible Modification**: Challenges in modifying AAV ITRs impact CpG content and ITR promoter activity.
- **Manufacturing Complexities**: Expensive mammalian cell culture-based production adds to the therapeutic's overall cost.

The Solution

To overcome AAV limitations, we developed a novel Synthetic AAV-like genome with distinct advantages:

- **Completely Synthetic:** Cell free, linear closed ended dsDNA with full ITRs assembled with enzymes
- **Customizable ITRs:** Reduce CpG content and eliminate ITR promoter activity
- **No Viral Capsid:** Reduced immune response
- **Plasmid Backbone Exclusion:** No bacterial sequences
- **Increased Payload Capacity:** Size limitations eliminated
- **Durable Expression:** Sustained (comparable to AAV)
- **Resistance to Pre-existing nAbs:** No capsid = no nAbs
- **No Extraneous DNA Co-packaging:** Precise delivery
- **Engineered TLR9 Inhibition:** By curtailing TLR9 signaling, we optimize safety and efficacy

Assets/Technology Under Development

- **AAV8-ELOVL2 Gene Therapy:** For dry-age related macular degeneration (sub-retinal administration)
- **Synthetic AAV Genome ELOVL2:** Lipid nanoparticle approach (suprachoroidal administration)
- **Synthetic AAV Genome ABCA4:** Lipid nanoparticle approach for Stargardt's Macular Dystrophy
- **Expanding Horizons:** Other applications for Synthetic AAV genomes

Key Differentiator

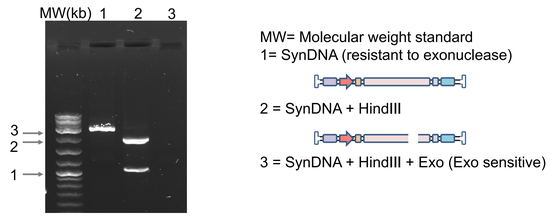
Cell-Free Advancement: Our synthetic AAV-like genomes revolutionize gene therapy by sidestepping traditional mammalian/insect cell culture. This innovation slashes manufacturing costs and accelerates production.

Rapid Assembly: With an assembly time of just three hours, our synthetic AAV-like genomes expedite research, development, and delivery.

Durability: Complete AAV inverted terminal repeat (ITR) sequences ensure lasting effectiveness, mirroring AAV's robust durability.

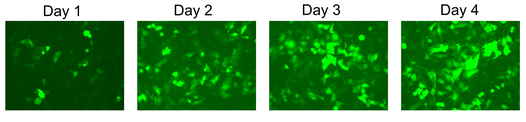
Key Scientific Findings

Synthetic AAV-Like Genomes are Simple and Quick to Manufacture



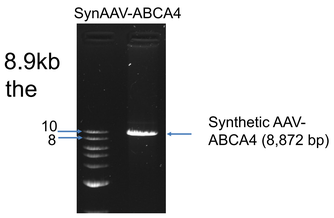
- Process takes about 4 hours to complete
- Assembly takes place in a single reaction buffer
- Scalable
- Current scale (700ul) results in ~30ug purified synthetic AAV DNA
- Typical mouse dose is 100ng, ~ 300 doses

Synthetic AAV-CMV-GFP Expresses Well in HeLa Cells

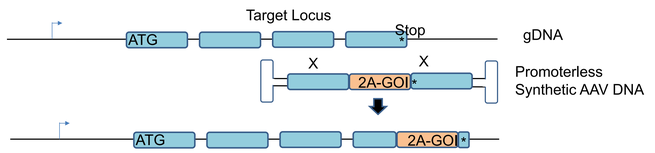


Large Synthetic AAV-Like AAV Genomes Can be Easily Assembled

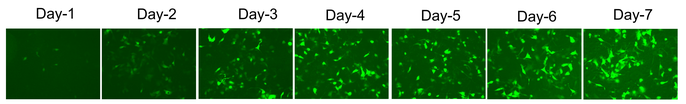
- Synthetic AAV-ABCA4 = 8.9kb
- Substantially larger than the 4.7kb payload of AAV



Synthetic AAV-Like Genomes can be Used as Donor Templates for Homology Directed Repair for Gene Addition

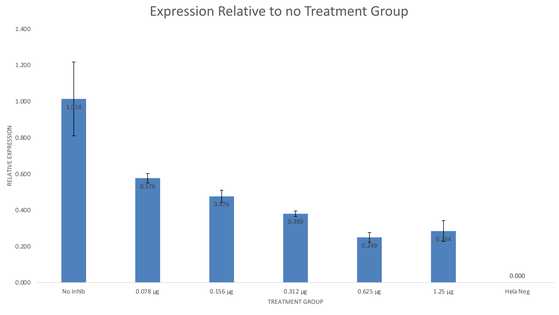


Synthetic AAV GFP Gene Addition in HepG2 Cells



Promoterless GFP placed in frame with the ALB gene and is under ALB promoter regulation

Synthetic AAV Expression is Tunable



Management Team

William Pedranti
President and CEO

Martin Emanuele
Co-Founder and CSO

Christopher Chavez
VP of R&D

Key Board Members

Arthur Becker, Chairman
Elaine Herron, BOD Member at BioMarin
Eric Carter, Former Allergan CMO

Company Development Timeline

1. Founded in 2018. UCSD exclusive technology license. $2.5M Series seed investment closed in 2019
2. ELOVL2 compositions filed in PCT (Q1 2020)
3. ELOVL2 gene therapy well tolerated in NPHs with strong expression in targeted cells with targeted biology (Q4 2022)
4. Synthetic AAV genomes filed in PCT (Q2 2023)
5. ELOVL2 dry AMD Pre-IND submission (Q2 2023)
6. Series A Targeted Q4 2023

Current Investors

1. Tech Coast Angels
2. Life Science Angels
3. Cove Fund
4. Fischli Venture Partners
5. Cobro Ventures

Target Market

1. Synthetic Biology: AAV platform out-licensing opportunity

Cast Your Vote