Viriome

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Revolutionary mRNA delivery technology

Collaboration

www.Viriome.eu

Viriome Problem

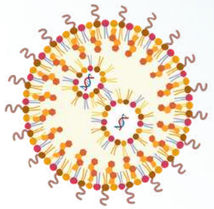
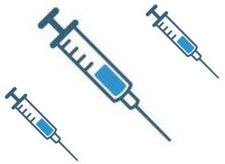
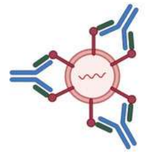
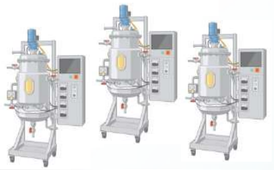
mRNA vaccines and therapeutics rely on lipid nanoparticle (LNPs) delivery systems, which are highly susceptible to degradation during distribution and while circulating in the patient's bloodstream.

While LNPs technology is a powerful delivery platform, it suffers from a major limitation: **limited stability.** Current mRNA vaccines and therapies are prone to degradation both during transportation and within the patient's body.

What does this mean in practice?

High costs: The need for complex transportation and expensive **cold-chain logistics.**

Reduced efficiency: Large doses are required to compensate for therapeutic losses during systemic circulation.

Lipid nanoparticles (LNPs)	
Poor Thermostability	
High doses	
Degradation in the patient's bloodstream	
Costly Scale-up	

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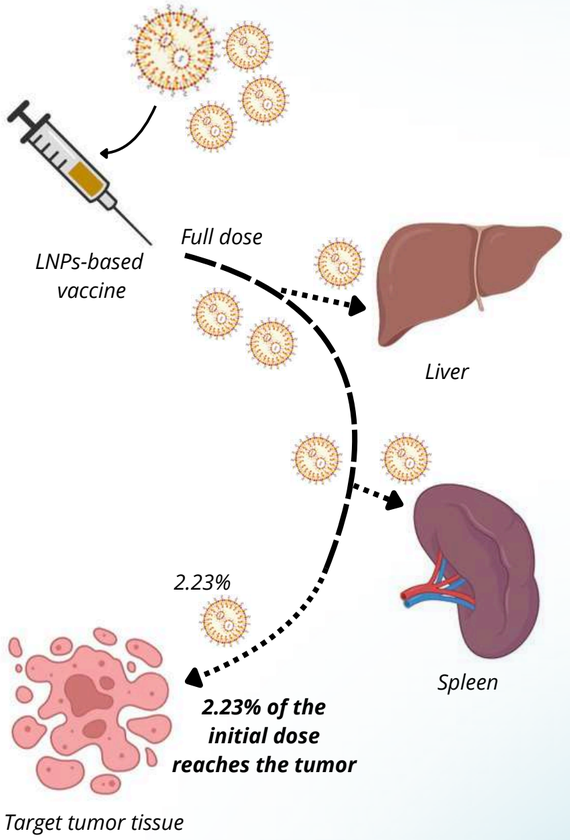
Problem - Scientific Rationale

Following intravenous administration, on average only 2.23% of nanoparticles reach tumor cells [1]. A large proportion of intravenously administered nanoparticles accumulates in the liver and spleen, increasing the risk of hepatotoxicity, which remains one of the major limitations of current AAV-based gene therapies [2].



1. Cheng, Yi-Hsien et al. “Meta-Analysis of Nanoparticle Delivery to Tumors Using a Physiologically Based Pharmacokinetic Modeling and Simulation Approach.” ACS nano vol. 14,3 (2020): 3075-3095. doi:10.1021/acsnano.9b08142

2. Duan, Dongsheng. “Lethal immunotoxicity in high-dose systemic AAV therapy.” Molecular therapy : the journal of the American Society of Gene Therapy vol. 31,11 (2023): 3123-3126. doi:10.1016/j.ymthe.2023.10.015

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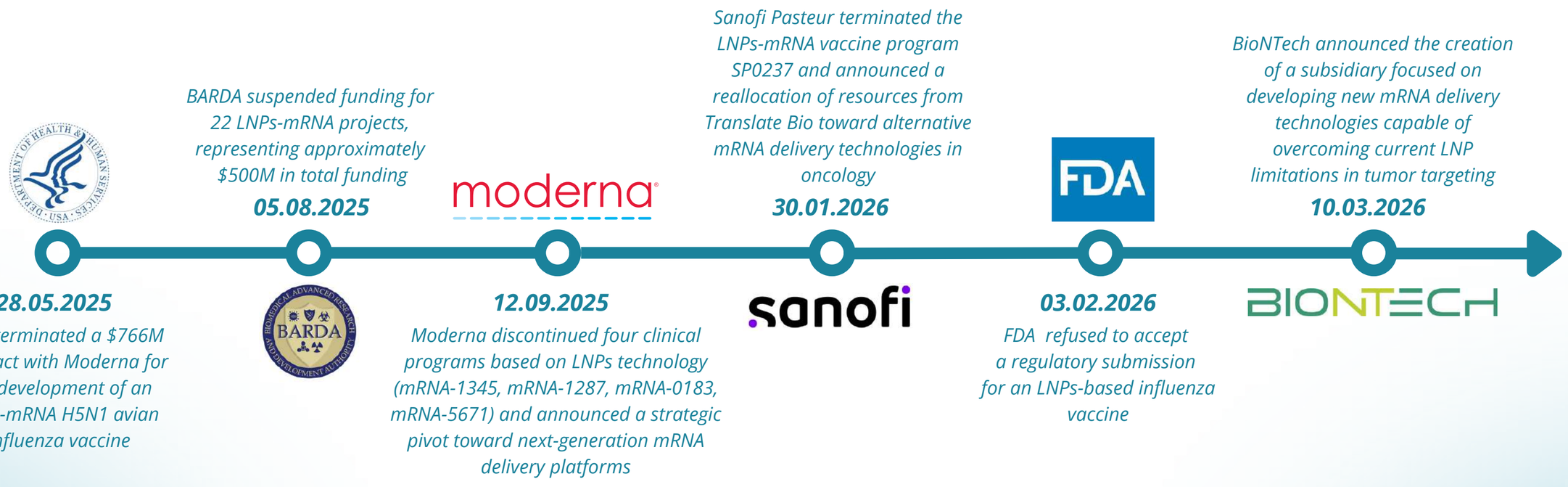
Problem - Market Reaction

Moderna and Sanofi have joined BioNTech in exploring next-generation platforms for delivering therapeutic mRNA to tumor cells.

Recent strategic decisions by major pharmaceutical companies suggest a growing recognition of the limitations of lipid nanoparticle (LNPs)-based delivery systems. In parallel, new R&D collaborations are emerging to address the delivery and efficiency challenges of LNPs-based mRNA vaccines, including technologies such as self-amplifying RNA (saRNA) and lentiviral vectors (LVs).



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Problem - Summary

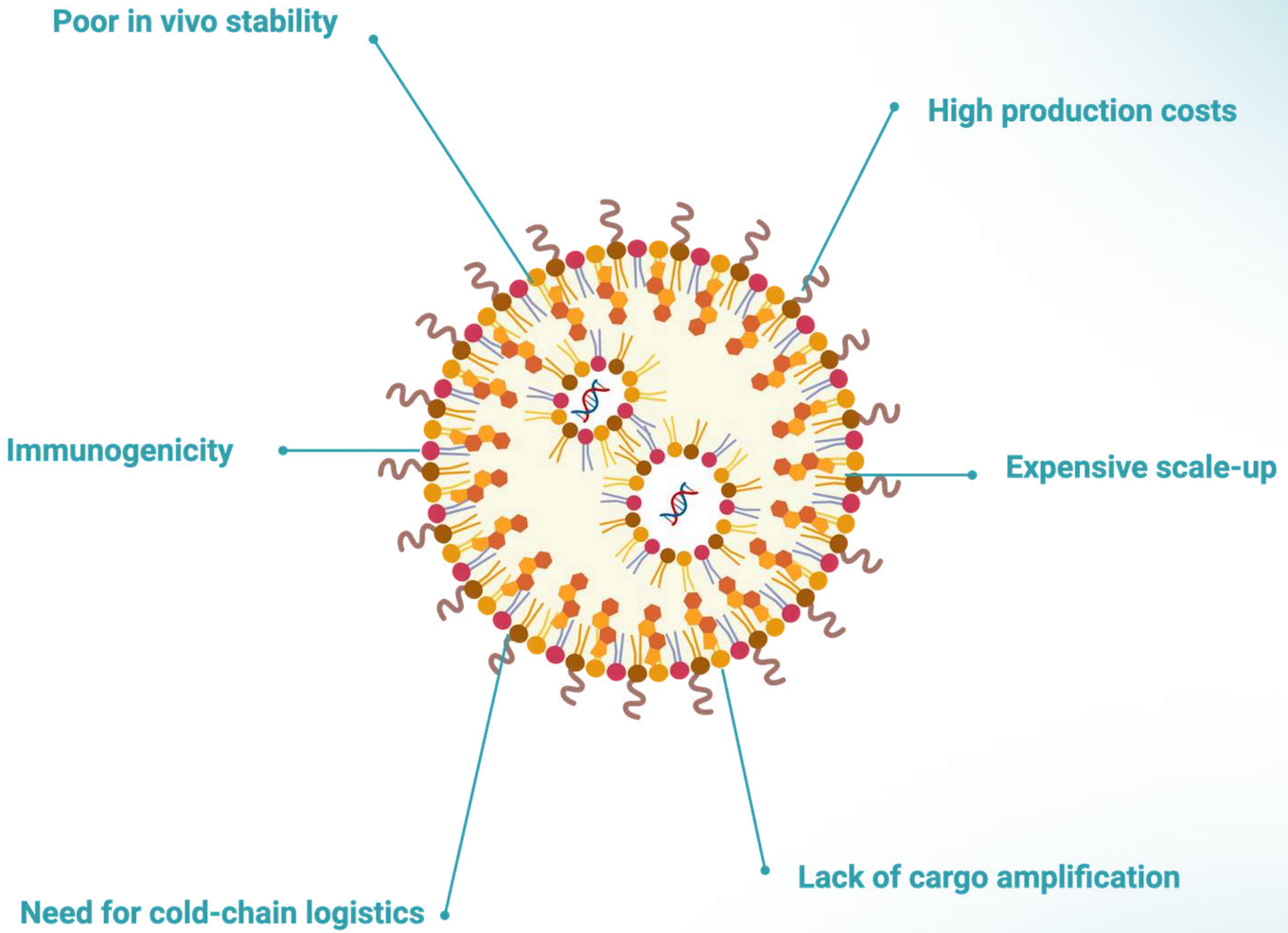
Therapeutic mRNA technologies require a new class of delivery vectors capable of providing greater stability and more efficient delivery to tumor cells. Current limitations include:

- Cold-chain logistics requirements increase costs and limit market access, particularly in the Global South.

- Low tumor delivery efficiency necessitates the use of high therapeutic mRNA doses.

- High dosing requirements increase both treatment costs and the risk of adverse effects.

- Hepatotoxicity associated with currently available delivery systems has contributed to the termination of clinical trials by the FDA [3].



Viriome
Team

Viriome is developing a breakthrough bacteriophage-based delivery platform designed to address the key limitations of current mRNA technologies: limited stability and high distribution costs.

Our team combines clinical expertise and laboratory experience in viral vectors and advanced biologics development to deliver a scalable platform technology for pharmaceutical partners.

Filip Nawrocki
Founder

Prof. Andrzej Mackiewicz
Research Director

Kacper Kupiec
Founder

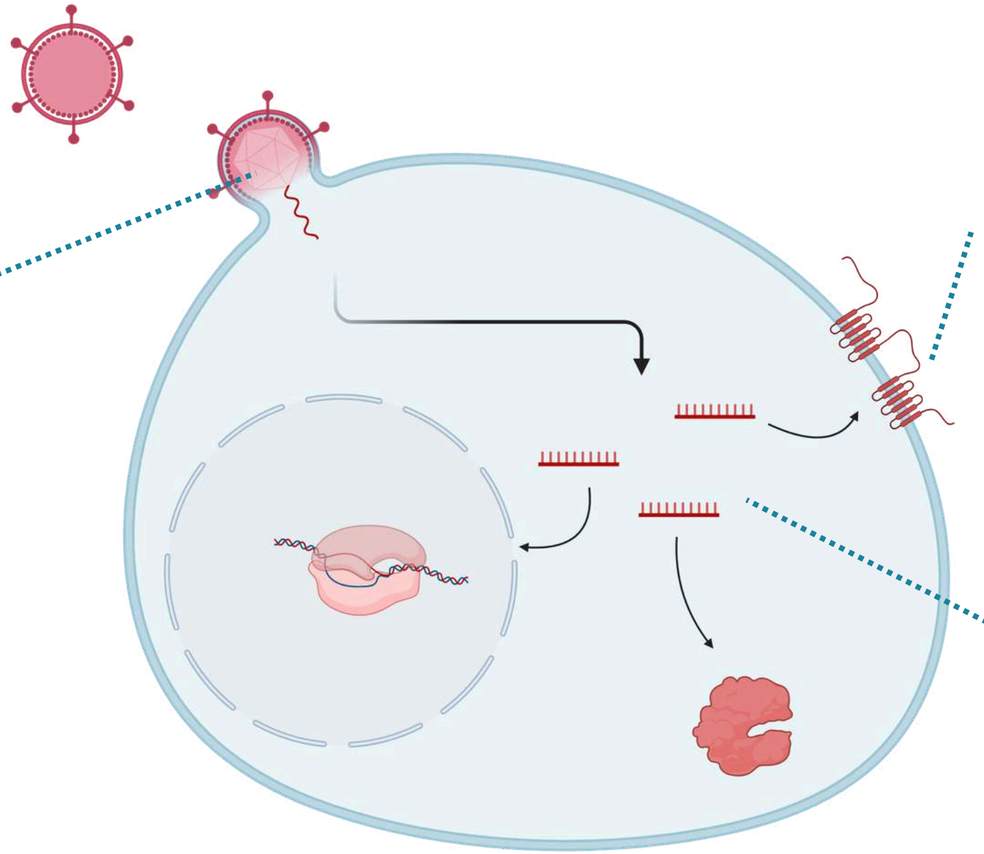
Prof. Gerard Drewa
Scientific Advisory Board

Prof. Michael Nishimura
Scientific Advisory Board

Bartosz Słowikowski PhD
Scientific Advisory Board

Bjorn-Erik Ole Jensen PhD
Scientific Advisory Board

Viriome Solution



Improved environmental stability to external factors preserves RNA integrity at elevated temperatures, enabling global distribution **without reliance on cold-chain logistics.**

The scalable and modular design is compatible with existing pharmaceutical manufacturing infrastructure and designed for applications across mRNA vaccines and therapeutics.

Built-in RNA amplification enables therapeutic efficacy at **significantly lower doses**, reducing manufacturing costs and the risk of adverse effects.

Phage vectors – intelligent carriers for therapeutic mRNA

With secured funding for preclinical research, Viriome is positioned to demonstrate how its technology can enable global access to mRNA therapies and vaccines, particularly across emerging and developing markets. We are currently seeking strategic partners interested in co-developing this platform toward IND-stage development.

Viriome Market

Total Available Market (**TAM**):

$20.84B Global therapeutic mRNA market

Serviceable Available Market (**SAM**):

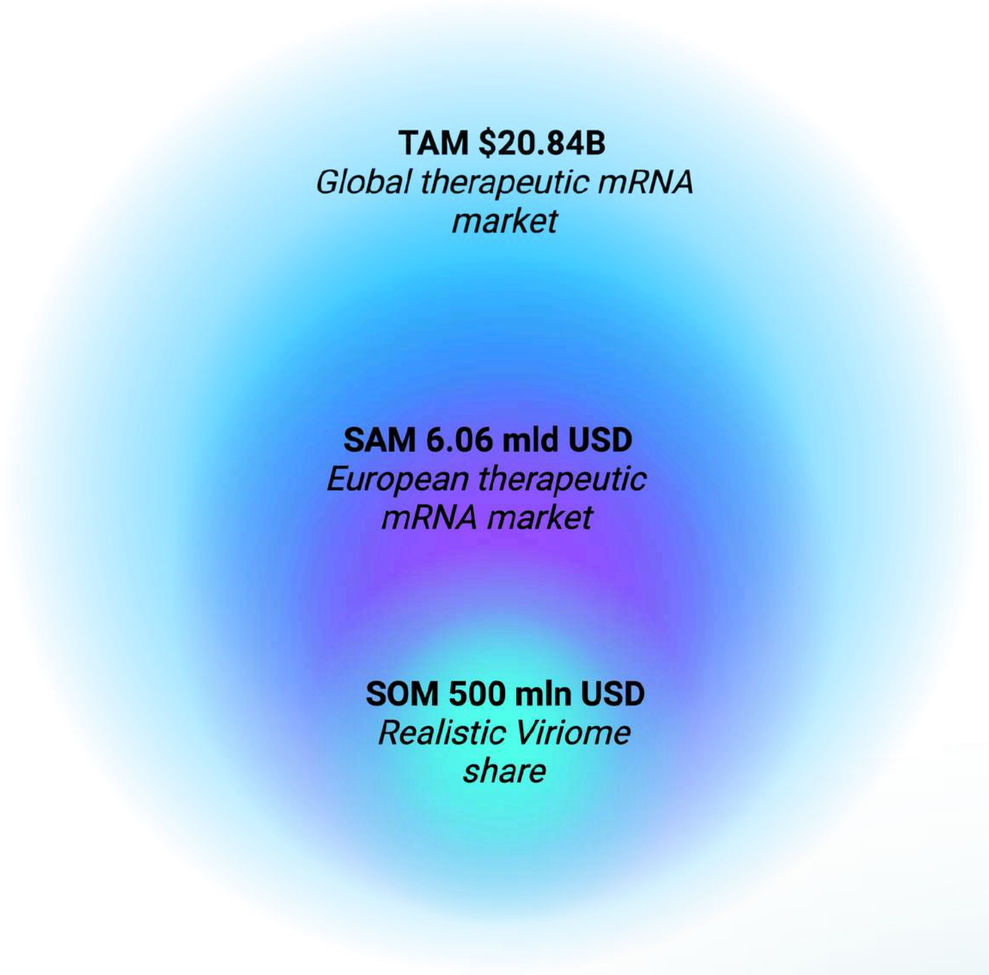
$6.06B European therapeutic mRNA market

Serviceable Obtainable Market (**SOM**):

$500M Realistic market share for Viriome in the next 5 years

Compound Annual Growth Rate (**CAGR**):

8.28% 2026 - 2034



https://www.precedenceresearch.com/mrna-therapeutics-market

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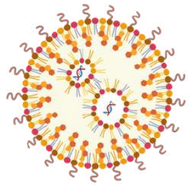
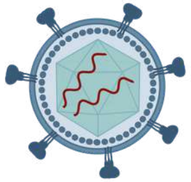
Competitive advantage





	LNPs	Phage vectors
Thermostability	✗	✓
Scale up	✓	✓
Scale up complexity	✓	✓
mRNA amplification	✗	✓

moderna — proprietary lipid nanoparticles

RNA-lipoplex formulation — BIONTECH

CUREVAC (the RNA people®) — Customized 5' and 3' mRNA UTRs

lipid-mediated delivery system - LUNAR® — ARCTURUS therapeutics

exploRNA — 5' CAP modifications

Most mRNA therapy developers focus on chemical modifications of lipid nanoparticles (LNPs) and mRNA 5′ cap structures. This approach introduces critical limitations, including dependence on cold-chain logistics and rapid RNA degradation. Limitations associated with LNP-based technologies hinder expansion into emerging markets, particularly across the Global South and Pacific.

Viriome
Early Traction

Research and Planning

Finalists of the CEE DeepTech Start-Up Challenge

1st place in the EU-funded Startup Accelerator (Unicorn Hub)

Completed market validation and patentability analysis

Prototype Development

Secured €235,000 in private investment

Application for a public grant of €140,000

Exploratory discussions with pharmaceutical companies

Product Development

Proof of concept

in vitro

in vivo

IP Protection

PCT international patent application

Iteration and Expansion

IND and CTA application

Seed and Series A funding rounds

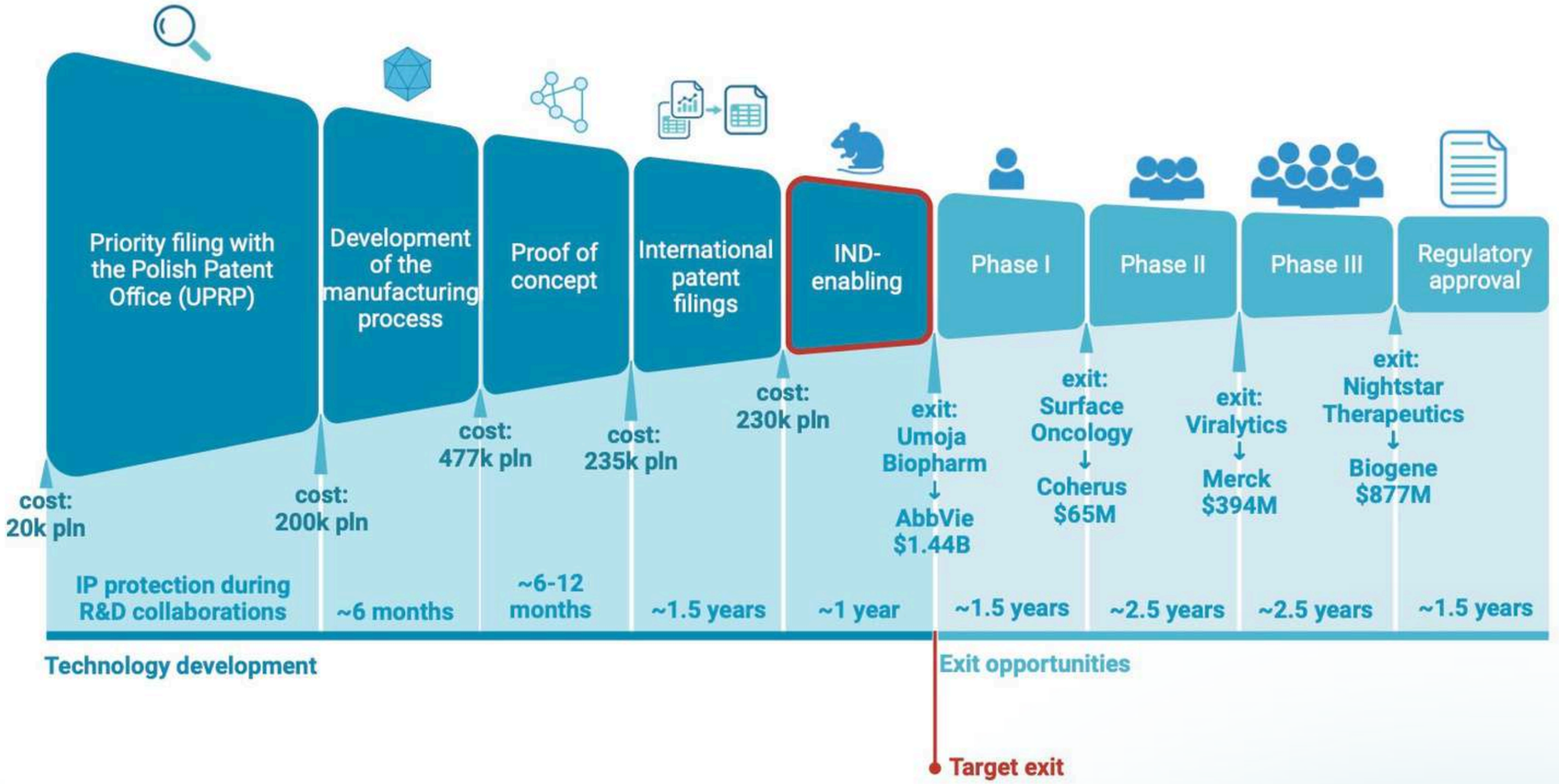
Preclinical Acquisition

Building regulatory roadmap for clinical readiness

Establishing contact with tech transfer offices and biopharma scouting teams

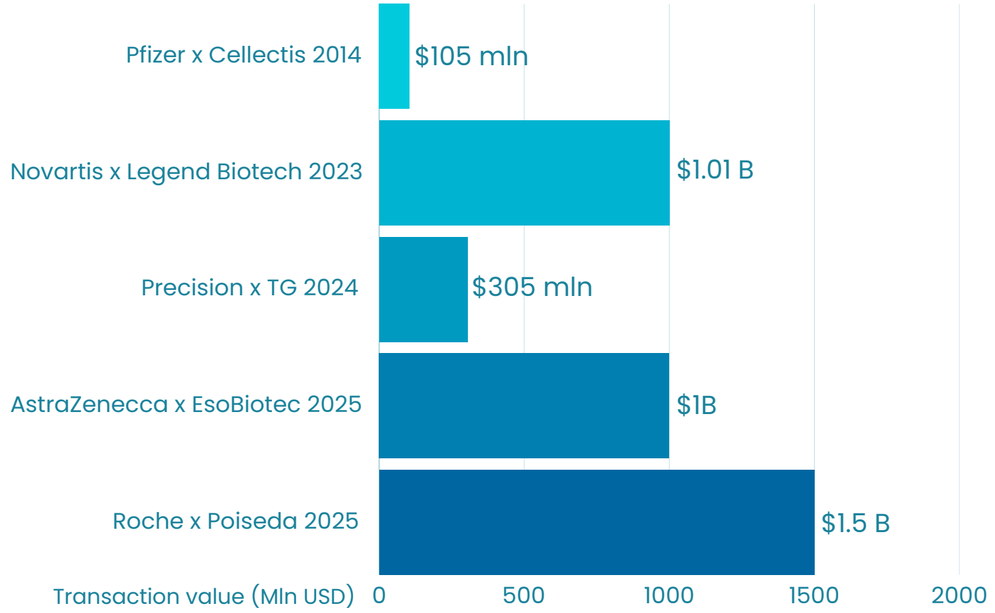
Viriome
Milestones

The cost and duration of each development stage have been presented alongside benchmark transactions at potential exit points. Based on these examples and a broader research desk analysis, the key driver of transaction value is the extent of technological improvements in the development and manufacturing processes of a therapy. Technologies that increase the accessibility of a treatment modality achieve higher valuations already at the IND-ready stage. Umoja Biopharma achieved one of the highest valuations upon receiving IND clearance, driven by the development of a viral vector technology significantly reducing the manufacturing cost of CAR-T therapies.



Viriome replicates this strategy while addressing the limitations of Umoja Biopharma's approach by increasing the genetic payload capacity of the vector and improving large-scale manufacturing, further enhancing the accessibility of gene and cell therapies.

Viriome
Exit Strategy



EXIT STRATEGY				
Stage of technological development	**Transaction type**	**Percentage of Technology Value**	**Percentage of transactions**	**Estimated time**
IND/CTA ready	M&A	100%	54,29%	5 years
IND/CTA ready	License agreement	40% - 60%	17,14%	4 years
IND/CTA ready	Joint Venture	50% - 70%	5,71%	4 years
Clinical phase	M&A	150% - 200%	17,14%	7 years
Clinical phase	License agreement	60% - 80%	2,86%	6 years
Clinical phase	Joint Venture	80% - 100%	2,86%	6 years

Research desk

Recent transactions in the viral vector space demonstrate high valuations even at early development stages. Preclinical stage technologies have reached valuations of up to $305M (e.g. TG Therapeutics–Precision BioSciences), while platforms with IND or CTA approvals, such as Poseida Therapeutics–Roche or AstraZeneca–EsoBiotec, have exceeded $1B in valuation. This represents a clear market signal of growing pharmaceutical interest in modular in vivo delivery platforms with scalable manufacturing potential.

Exit strategies

Market data indicates that technologies similar to Viriome are most commonly acquired at the IND/CTA-ready stage, which offers the optimal balance of probability, value, time, and risk. Alternatively, licensing remains a viable strategy, generating revenue through upfront payments, milestone payments, and royalties. A third commercialization pathway is co-development with a strategic partner in a joint venture model. At the clinical stage, acquisitions and licensing deals occur less frequently, but may provide additional value upside.

Viriome
Our story so far

World-class science behind Viriome

Our team combines expertise in oncology, genetic engineering, and molecular biotechnology with a unique network of R&D partners enabling international commercialization:

- **Prof. A. Mackiewicz** (CSO) – **Creator of AGI-101H**, a first-in-class cell-based melanoma vaccine. AGI-101H has completed six Phase I/II clinical trials involving 348 patients with stage III/IV melanoma, demonstrating 45% 5-year overall survival.
- **Prof. M. Nishimura** – Leading expert in genetic engineering and viral vector design at **Loyola University Chicago**, previously a member of one of the pioneering teams developing **CAR-T cell therapies.**

Funded to execute

- We have signed a **Term Sheet** outlining the terms of a **PLN 1M investment** from **Baromedical** to support the preclinical development of Viriome's technology.
- **Ranked #1 in the Platformy Startowej Unicorn Hub 2.0** → currently preparing a PLN 600,000 grant application under Komponent IIa.
- **Finalists of the CEE DeepTech Startup Challenge 2024** → our pitch at the Warsaw Stock Exchange enabled us to establish relationships within the genetic engineering community, including Prof. Rozwadowska.
- **Invited as VIPs to London Tech Week 2025** → epresenting Polish biotech startups allowed us to validate market interest in Viriome with **C-level executives from AstraZeneca, GSK, and Eli Lilly** during dedicated industry meetings.

Validated by industry leaders

The results confirmed strong market demand for innovative, cost-effective, and safer mRNA delivery technologies. Industry representatives expressed interest in potential collaboration following preclinical development, as well as **future licensing opportunities.**

Viriome
Future outlook

What do we want to achieve with the secured funding?

The funds raised in the first financing round will be allocated to the preclinical development of Viriome's technology, including:

- **In vitro validation** of the designed bacteriophage vectors for efficient mRNA delivery to tumor cells,
- **Priority filing with the Polish Patent Office (UPRP)** to secure Viriome's IP during ongoing R&D collaborations,
- **International PCT patent filing,**
- **IND-enabling studies,** including services provided by Charles River Laboratories, aimed at generating the experimental data and documentation required to obtain IND and CTA approvals for initiating Phase I clinical trials

What are our next opportunities?

Through collaboration with partners experienced in the development of oncology gene therapies, Viriome has secured the opportunity to present its project–upon obtaining strong preclinical data–to key industry leaders such as:

- **Uğur Şahin –** founder of BioNTech, a global leader in immunooncology and mRNA technologies, with a proven track record of commercializing biotech innovations originating from Poland.
- **Michał Sołowow –** the largest private biotech investor in the CEE region, with strategic capital and extensive experience in scaling deep-tech ventures.

Viriome also has the potential to establish a consortium with:

- Poznań University of Medical Sciences Oncology Institute
- Neurology Clinic of Poznań University of Medical Sciences.

This would enable patient recruitment and the preparation of joint grant applications aimed at initiating early-phase clinical trials.

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Investment proposal

Opportunity

10%
Offered Equity

1M PLN*
Investment amount

Timeline

3 years
IND-ready

5 years
Commercialization

Contact

www.Viriome.eu

vectorstudio.contact@gmail.com

**The “Milestones” slide shows the options for scheduling investment tranches based on the project stages achieved