YOUR TECHNOLOGY

An ionizable lipid nanoparticle platform delivering enzyme-encoding mRNA to hepatocytes for a rare inherited metabolic disease.

01 STRATEGIC READ

SIGNAL CONFIRMED · STRONG

Ionizable LNP mRNA delivery for a rare inherited metabolic disease sits in a well funded, fast moving corner of genetic medicine.

NIH has funded LNP enabled mRNA and enzyme replacement programs across several Institutes, and disease foundations co fund rare metabolic work; the near term money is real and the field is competitive.

DIRECT YOUR APPLICATION TO

NIDDK · National Institute of Diabetes and Digestive and Kidney Diseases

NIDDK is the natural home for inherited metabolic disorders of the liver and inborn errors of metabolism, and funds enzyme replacement and metabolic disease therapeutic development, which puts the lead indication squarely in its portfolio.

WHY THIS PATH

The recommended path leads with the metabolic indication and its clearest institutional home: NIDDK funds inborn errors of metabolism and liver directed therapeutic development, so an SBIR framed around functional correction of a defined hepatic enzyme deficiency fits its portfolio directly. Positioning the ionizable LNP mRNA system as the delivery mechanism, rather than the headline, keeps NIAID and ARPA-H open as platform focused alternates as the program matures.

LANDSCAPE · A hot, crowded space: LNP and mRNA delivery has drawn heavy NIH and private investment since 2020, so reviewers expect a clear delivery differentiator, not another generic LNP.

> **WHAT STRENGTHENS THIS APPLICATION**
>
> Demonstrate in vivo proof of concept in a validated disease model showing that your LNP formulation delivers mRNA to hepatocytes, expresses the target enzyme at therapeutic levels, and produces measurable functional or biochemical correction before submitting Phase I.

02 SUGGESTED APPROACH ORDER

1. **NIDDK SBIR Phase I (R43)** establish in vivo proof of concept: LNP mRNA hepatocyte transfection,

enzyme expression, and functional rescue in a validated metabolic disease model.

2. **Disease specific rare foundation award** if the metabolic disorder has an active patient foundation, a pilot grant can de risk manufacturing scale up and generate patient registry data.

3. **NIDDK SBIR Phase II (R44)** advance to GLP toxicology, repeat dose pharmacology, and IND enabling studies with a clear regulatory path.

03 ALSO PLAUSIBLE

NIAID Holds the deepest federal investment base in ionizable LNP and mRNA delivery chemistry, a fit if you lead with the delivery platform rather than the indication.

funding page >

ARPA-H A fit if the platform can be framed as a broadly reprogrammable delivery capability with a bold, milestone driven development plan.

funding page >

NICHD Relevant if the rare disease presents in pediatric patients, where NICHD funds inborn errors of metabolism.

04 PRIVATE & PHILANTHROPIC SOURCES

National Organization for Rare Disorders (NORD) DISEASE FOUNDATION

Runs research grant programs and can bridge early non dilutive gaps for indication specific rare disease work.

funder page >

EveryLife Foundation for Rare Diseases PATIENT ADVOCACY

Convenes rare disease patient communities and can strengthen the significance and patient registry case.

funder page >

Foundation and venture-philanthropy leads · not in federal databases · confirm current programs and eligibility with each funder.

05 VERIFIED FUNDING RECORD · NIH REPORTER

$5,210,000 in non-dilutive funding across 6 comparable awards, FY2022-2025.

WHERE THE MONEY IS · BY INSTITUTE

NIDDK	$2,150,000	2 awards
NIAID	$1,480,000	2 awards
NCATS	$980,000	1 award
NICHD	$600,000	1 award

FUNDED ORGANIZATIONS

Helix Therapeutics, Inc.	$1,900,000

Meridian Bio, Inc.	$1,510,000
Verda Therapeutics, Inc.	$980,000
Northpoint Genomics, Inc.	$820,000

MOST ACTIVE INVESTIGATORS

Chen, L.	2 awards
Okafor, A.	1 award
Reyes, M.	1 award
Sato, K.	1 award

COMPARABLE AWARDS

Ionizable lipid nanoparticles for hepatocyte directed mRNA delivery in inherited — $1,150,000
Helix Therapeutics, Inc. · R44 · FY2024 — view on RePORTER >

An mRNA enzyme replacement platform for a rare liver metabolic disorder — $980,000
Meridian Bio, Inc. · R44 · FY2023 — view on RePORTER >

Optimizing LNP formulation for durable hepatic mRNA expression — $750,000
Helix Therapeutics, Inc. · R43 · FY2025 — view on RePORTER >

Preclinical development of mRNA delivered enzyme for an inborn error of metabolism — $820,000
Northpoint Genomics, Inc. · R44 · FY2022 — view on RePORTER >

Translational LNP mRNA platform for rare disease — $980,000
Verda Therapeutics, Inc. · R44 · FY2024 — view on RePORTER >

Feasibility of hepatocyte targeted mRNA for metabolic rescue — $530,000
Meridian Bio, Inc. · R43 · FY2022 — view on RePORTER >

Verified against NIH RePORTER v2 (public federal data). Figures are award obligations as reported; confirm current status before relying on them.

06 VERIFIED FEDERAL CONTRACTS & OTAS · USASPENDING

The money NIH RePORTER does not hold: BARDA, ARPA-H, and DoD contracts and Other Transaction Agreements.

$18,400,000 in federal contracts & OTAs across 4 comparable awards, FY2022-2025.

WHERE THE MONEY IS · BY AGENCY

Advanced Research Projects Agency for Health	$9,500,000 ·	1 award
Assistant Secretary for Preparedness and Response (BARDA)	$6,200,000 ·	2 awards
Defense Health Agency	$2,700,000 ·	1 award

FUNDED ORGANIZATIONS

Helix Therapeutics, Inc.	$9,500,000
Meridian Bio, Inc.	$4,000,000
Northpoint Genomics, Inc.	$2,700,000
Verda Therapeutics, Inc.	$2,200,000

COMPARABLE AWARDS

Reprogrammable LNP mRNA delivery platform for rapid response therapeutics — $9,500,000
Advanced Research Projects Agency for Health · OTA / Other · FY2024 — view on USAspending >

Advanced manufacturing of ionizable lipid nanoparticles for medical countermeasures — $4,000,000
Assistant Secretary for Preparedness and Response (BARDA) · Contract · FY2023 — view on USAspending >

Stabilized mRNA cargo for hepatic delivery under field conditions — $2,700,000
Defense Health Agency · Contract · FY2022 — view on USAspending >

Scale up of LNP formulation for stockpile ready therapeutics $2,200,000

Assistant Secretary for Preparedness and Response (BARDA) · Contract · FY2025 view on USAspending >

Verified against USAspending.gov (public federal data). Contracts and Other Transaction Agreements, awarding sub-agency as reported; confirm current status before relying on them.

07 MECHANISM & SEARCH TERMS

R43 SBIR Phase I · feasibility of the delivery platform in a disease model

R44 SBIR Phase II · IND enabling development once feasibility is shown

Search terms: ionizable lipid nanoparticle · mRNA delivery · hepatocyte · enzyme replacement · rare metabolic disease · LNP formulation · inborn error of metabolism

08 WHERE TO LOOK NEXT

NIH RePORTER
Verify comparable awards, dollar totals, and active PIs against the real record.
https://reporter.nih.gov/

SBIR.gov
Browse open SBIR/STTR solicitations across all federal agencies.
https://www.sbir.gov/solicitations

ARPA-H
High-risk, high-reward health programs and open funding calls.
https://arpa-h.gov/engage-with-us/open-funding-opportunities

BARDA / DRIVe
Medical countermeasures and health-security funding via contracts and OTAs.
https://drive.hhs.gov/

USAspending.gov
Verify BARDA, ARPA-H, and DoD awards that are not in NIH RePORTER.
https://www.usaspending.gov/search

NSF SEED Fund
A non-NIH deep-tech SBIR path for engineering or platform work.
https://seedfund.nsf.gov/

Candid Foundation Directory
Search private foundations and disease nonprofits by cause.
https://candid.org/find-funding

ProPublica Nonprofits
Read a foundation's public 990 filings.
https://projects.propublica.org/nonprofits/

09 SPECIFIC AIMS · DRAFT V0.1 · TUNED TO NIDDK

Inherited metabolic diseases caused by a single deficient hepatic enzyme remain without a durable treatment for many patients, and current enzyme replacement approaches are limited by short half life, immunogenicity, and the inability to reach intracellular compartments. There is a clear unmet need for a delivery technology that restores functional enzyme activity in hepatocytes at therapeutic levels. This project develops an ionizable lipid nanoparticle platform that delivers enzyme encoding mRNA to hepatocytes, producing the missing enzyme in situ.

Aim 1. Establish delivery and expression. We will formulate and screen ionizable LNPs carrying enzyme encoding mRNA and quantify hepatocyte uptake and enzyme expression in vitro and in [ANIMAL MODEL], targeting expression above [THRESHOLD] over [DURATION].

Aim 2. Demonstrate functional correction. We will administer the lead formulation in [DISEASE MODEL] and measure biochemical correction of the deficient pathway, targeting a [FOLD CHANGE] improvement in [BIOMARKER] relative to untreated controls.

Aim 3. Assess durability and tolerability. We will evaluate repeat dosing, durability of expression, and preliminary safety across [DOSE RANGE], establishing the parameters needed to plan IND enabling studies.

Successful completion will yield a validated hepatocyte directed mRNA delivery platform with in vivo proof of functional correction, de risking the path to IND enabling development and a Phase II application.

DRAFT ONLY · replace every [BRACKETED] placeholder with real data before submission · GrantScope does not fabricate preliminary results.