

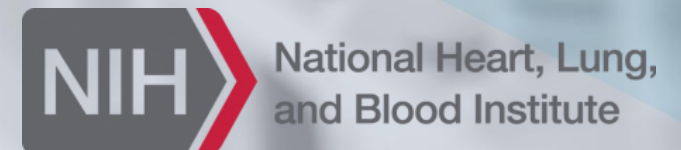


In Vivo Gene Therapy Program Overview and Office Hours

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RTI: Diana Severynse-Stevens and Sudie Rowshan

Friday, September 11, 2026



Agenda

- ▶ **Overview of the NHLBI Catalyze Program**
- ▶ Launch of the Catalyze *In Vivo* Gene Therapy Program
- ▶ Developing your Expression of Interest (EOI) response



Catalyze provides a comprehensive suite of support and services to facilitate the translation of basic heart, lung, blood and sleep discoveries into viable therapeutics, devices and diagnostics ready for human testing.

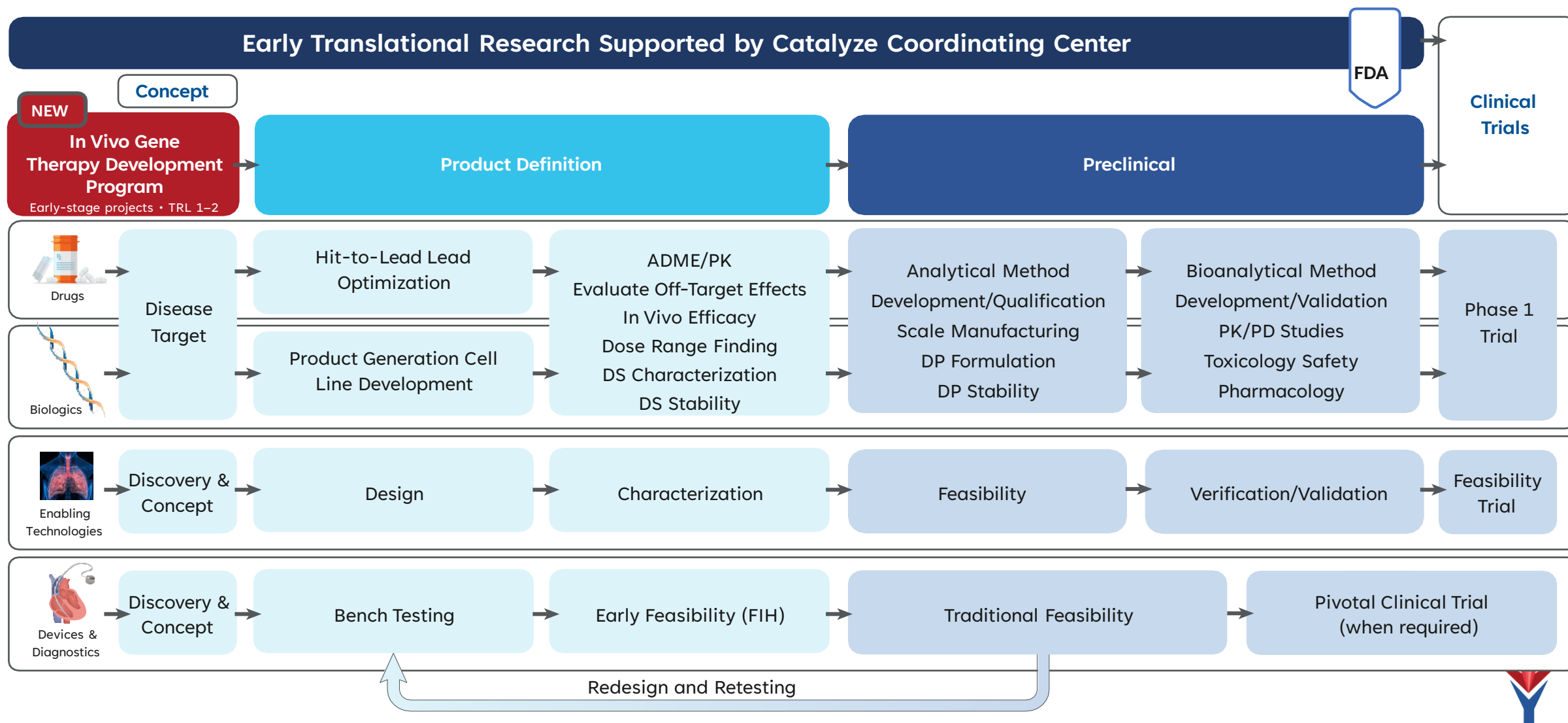
Feel free to reach out to Catalyze at any time to engage.

We want to hear from you!

- » See the Catalyze website nhlbicatalyze.org
- » For more information email catalyze_info@rti.org

- **Support**
Milestone-driven individualized project management and technical support
- **Approach**
Seamless continuum of programs to advance promising technologies
- **Flexibility**
Oversight to adjust projects based on trends and challenges

Catalyze is a New Approach to Translational Research Support



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NHLBI's Commitment to Advancing Transformative Therapies



Unleashing the potential of high-risk, high-reward innovations towards scalable treatments for blood diseases

2018

Launched Cure Sickle Cell Initiative

5-year plan focused on trial-ready therapies and filling funding gaps while recognizing early limits to wide adoption; established partnership with [CIRM](#).

2019

Partnered with the Gates Foundation

Joint effort to develop gene-based cures for SCD and HIV at global scale, from pre-clinical through clinical evaluation.

2026

Today: next-generation program

Building on this foundation to launch a new initiative.

VISION

Accelerate the development of gene therapies aimed at curing sickle cell disease.

Goals

- Create a collaborative, patient-focused research environment
- Engage academic and private researchers, advocates, patients, and caregivers
- Determine the safest, most effective and widely adoptable gene therapies
- Move newly developed gene therapies into clinical trials

Launch of the *In Vivo* Gene Therapy Development Program



Unleashing the potential of high-risk, high-reward innovations towards scalable treatments for blood diseases



Roadblocks identified — common field-wide barriers have emerged while developing gene therapies that overcome the limits of recently approved SCD therapies.



Program launched — **NHLBI's In Vivo Gene Therapy Development Program** invites the scientific community to help close this gap.



Scope — starting with sickle cell disease, expanding to other blood disorders.

CALL FOR CONCEPTS

If your concept challenges prevailing assumptions, bridges disciplines, or offers a novel approach to overcoming [fundamental barriers](#), we want to hear from you!





WHO SHOULD APPLY?



Too early? Too risky? **THAT IS THE POINT.**

NHLBI is funding high-risk, high-reward ideas at TRL 1-2 that may be too early for conventional support—because breakthroughs **start here**.

Funding

Initially fund a wide range of proof of concept projects that propose **innovative solutions** to **key barriers** targeting HSCs (with emphasis in SCD).

Focus

Initial funding will target:

- **Novel vector platforms**
- **Non-viral delivery systems**
- **Immune evasion technologies**
- **Translational models or assays**



For each barrier, see details gathered from previous workshops



Understand the core problem of each barrier



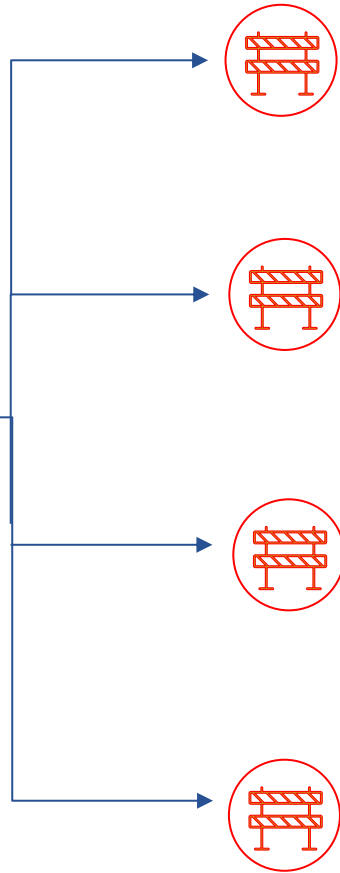
Key consensus and key trends from experts



Suggested actionable opportunities to overcome barriers

The Key Barriers

There are four
key barriers
bottlenecking
progress.



Limited ability to predict
in vivo therapy performance
from in vitro results.

Uncertainty regarding the
translational relevance of
humanized mouse models.

Limited understanding of
immune tolerance to newly
expressed proteins.

Lack of experimental models
that capture **biologically
relevant niche** intercellular
interactions.

WHAT WE'RE LOOKING FOR:



Novel vector platforms



Non-viral delivery
systems



Immune evasion
technologies



Translational models



Other barrier-breaking
approaches

Unexplained In Vitro vs. In Vivo Mismatch

Core Problem: A fundamental gap remains between delivery system performance in vitro and in vivo, limiting translation and prioritization.

Expert Consensus



- In vitro success does not predict in vivo performance, especially when organ sequestration is overlooked.
- Standard in vitro systems cannot replicate in vivo conditions like flow dynamics.
- HSCs that cycle in vitro may not cycle in vivo, limiting HDR-mediated editing.

Actionable Opportunities



- Invest in cross-species biodistribution studies to build a translational database.
- Pair biodistribution and organoid studies to identify predictive in vitro findings.
- Prioritize HSC models that capture disease state and cell cycle status.

Catalyze *In Vivo* Gene Therapy Development Program

supports bold, early-stage ideas

High-risk, high-reward
early-stage concepts

Proof-of-concept projects
12–18 months

Technology Readiness
Level 1–2



Program Opportunity

To accelerate transformative *in vivo*
HSC and gene therapies

Initial focus areas (not limited to)

- Novel vector platforms
- Non-viral delivery systems
- Immune evasion technologies
- Translational models or assays

How to Apply

Submit an Expression of Interest (EOI)

- 1 EOI submission September 3–20, 2026
- 2 Pitch day **REQUIRED, in person**
November 5, 2026 (for selected applicants)
- 3 Full application Prioritized concepts for external review

How do you apply to the *In Vivo* Gene Therapy Development Program?

- Step 1** All applicants must submit an expression of interest form (EOI).
Online submissions will begin on **September 3, 2026** and end on **September 20, 2026**.
You may download a preview of the EOI form:
- [Download EOI form \(PDF\)](#) [Download EOI form \(Word\)](#)
- Note:** An EOI submission is only needed for preclinical, regulatory, and *in vivo* gene therapy services.
- Step 2** After EOI submissions, a select group of applicants will be invited to participate in a required 1-day event at NHLBI on **November 5th, 2026** to present their concept.
- Step 3** Prioritized concepts will advance to a full application submission and external review.



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- ▶ **Developing your Expression of Interest (EOI) response**

EOI Walkthrough

Applicant Last Name: _____

Project Title: _____

Date of Submission: _____

Section 1: Contact Information

Provide contact information for the principal investigator (PI) of this application. If the PI has designated a representative to submit the proposal on their behalf, please enter the designee's contact information as well.

1. Project Title: _____
2. Principal Investigator (Last Name, First Name): _____
3. Organization: _____
4. Title: _____
5. Department (or Discipline): _____
6. Street Address: _____
7. City: _____
8. State: _____
9. Zip code: _____
10. PI email address: _____
11. PI telephone number: _____
12. Name and contact information for corresponding organizational representative, if not the PI: _____

13. How did you learn about Catalyze? (Select all that apply):

- | | |
|---|--|
| ☐ NIH/NHLBI website | ☐ My technology transfer office |
| ☐ NHLBI Catalyze website | ☐ Scientific conference or news article |
| ☐ NIH Translational Program(s) | ☐ NIH Program Officer |
| ☐ Catalyze event | ☐ Other (Please specify): _____ |
| ☐ My institution/department | |

Section 2: PI Demographic Profile

Your responses to the following questions allow the Catalyze Coordinating Center to better understand the demographic profile of investigators interested in Catalyze award programs. Your responses to these questions have no influence on proposal selection and will not be shared with reviewers.

14. Position or title: _____
15. Terminal Degree: _____
16. Year of Terminal Degree (or Expected Completion Year): _____
17. Has your professional experience to date been characterized by any of the following?
Select all that apply:
 - ☐ Been granted a copyright, patent, or trademark
 - ☐ A patent has been issued
 - ☐ Licensed your technology to another party
 - ☐ Applied for funding from a translational research, proof-of-concept, or commercialization support program—other than Catalyze
 - ☐ Received funding from a translational research, proof-of-concept, or commercialization support program—other than Catalyze
 - ☐ Founded a start-up company

Section 3: Technology Profile

Provide the following information about the project for which Catalyze assistance is sought.

18. What barrier does your concept address (select one):

- ☐ Gaps in translating in vitro models for in vivo outcomes
- ☐ Translating humanized mouse models to human studies
- ☐ Uncertain immune tolerance to foreign therapeutic proteins
- ☐ Niche-specific intercellular crosstalk absent in existing models
- ☐ Other (50-word limit)

19. Type of project (select up to 2):

- | | |
|--|--|
| ☐ Novel viral platforms | ☐ Targeted Lipid Nanoparticle (LNP) Platforms |
| ☐ Non-viral delivery systems | ☐ Translational models or assays |
| ☐ Immune evasion technologies | ☐ Other (50-word limit) |
| ☐ Gene editing systems | _____ |

EOI Walkthrough

20. What is the specific technology or product (50-word limit)?

21. Indicate the status of intellectual property protection for this technology

- ☐ No invention disclosure filed with technology transfer office (or equivalent)
- ☐ Invention disclosure filed with TTO (or equivalent)
- ☐ A patent application has been submitted
- ☐ A trademark has been registered
- ☐ A copyright has been granted
- ☐ Patent has been issued

22. **Project Description.** In 1,000 words or less, please provide an overall description of your project **and how it ties into your response for what barrier your concept addresses** (in question 18).

Include the following:

- Project purpose or objective
 - Details of any preliminary studies conducted
 - Concise description of the proposed studies
 - Proposed high level milestones
-

Q&A

- Learn more and subscribe to the mailing list:
<https://nhlbicatalyze.org/invivo>
- Reach out:
 - NHLBI_catalyze@mail.nih.gov
 - catalyze_info@rti.org
- Key Deadlines:
 - EOI responses due **September 20, 2026**
 - Invite-only pitch day at NIH in Bethesda, MD on **November 5, 2026**
- Eligibility:
 - U.S. academics, non-profits, and for-profit small businesses

Travel and incidental expenses will be reimbursed in-line with GSA per diem rates.

