



ARPA-H: The Mission

The Advanced Research Projects Agency for Health

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7th Virtual Joint Meeting of the Board of Scientific Advisors (BSA) and
the National Cancer Advisory Board (NCAB)

December 6, 2022

Our Mission

**Accelerate better
health outcomes
for everyone.**



President Biden's Vision

"ARPA-H will pursue ideas that break the mold on how we normally support fundamental research and commercial products in this country."

"Ideas so audacious that people say they just might work only if, only if, we could try. Well, we're about to try in a big way!"

- President Biden Remarks, March 18, 2022



Our Vision

Solutions to preserve and expand health

Our Slow Sputnik Moment

We live in an era of complex technologies with massive economic and social disruptions. Powerful biological factors include pandemics that make us sick and emerging biotechnologies to make us well.

Our Promise

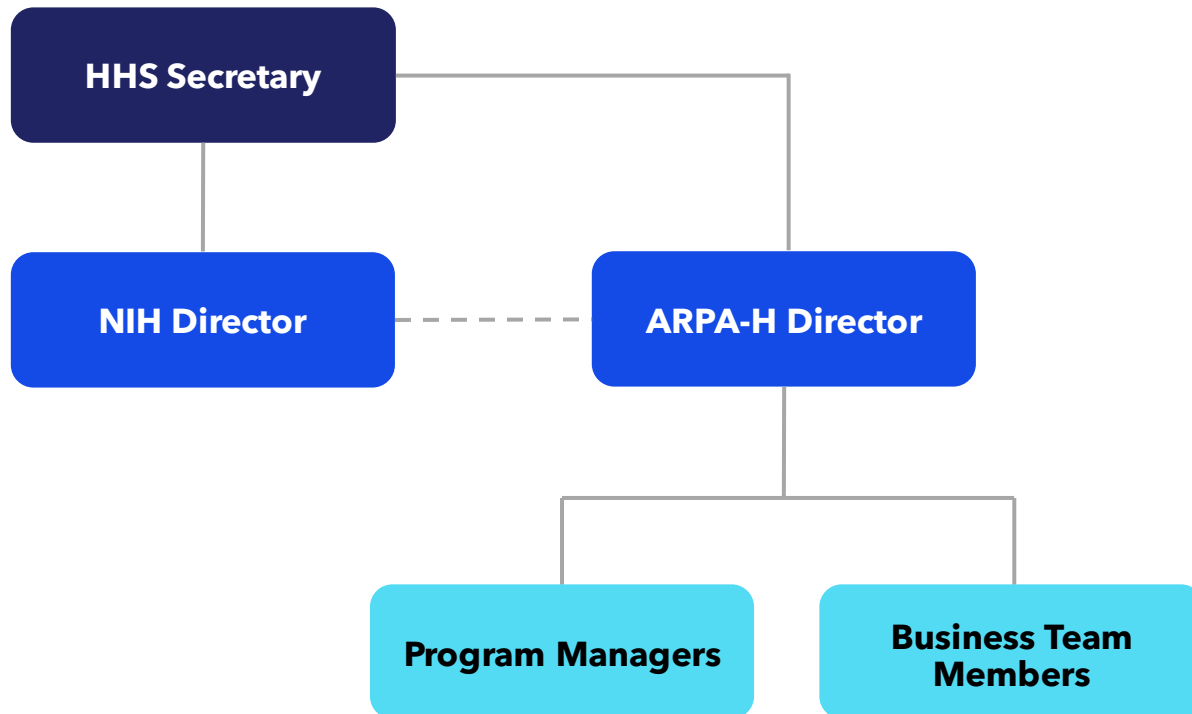
ARPA-H Program Managers (PMs) design, build, and launch ***solutions*** to create the best version of our health future.

Imagine if...

- **Cell therapies could be built and assembled on demand, readily re-programmed for each new disease target**
- **MRIs could be delivered in the comfort of your home**
- **A personalized cancer vaccine cost the same as a cup of coffee**
- **We could all realize a better health future.**



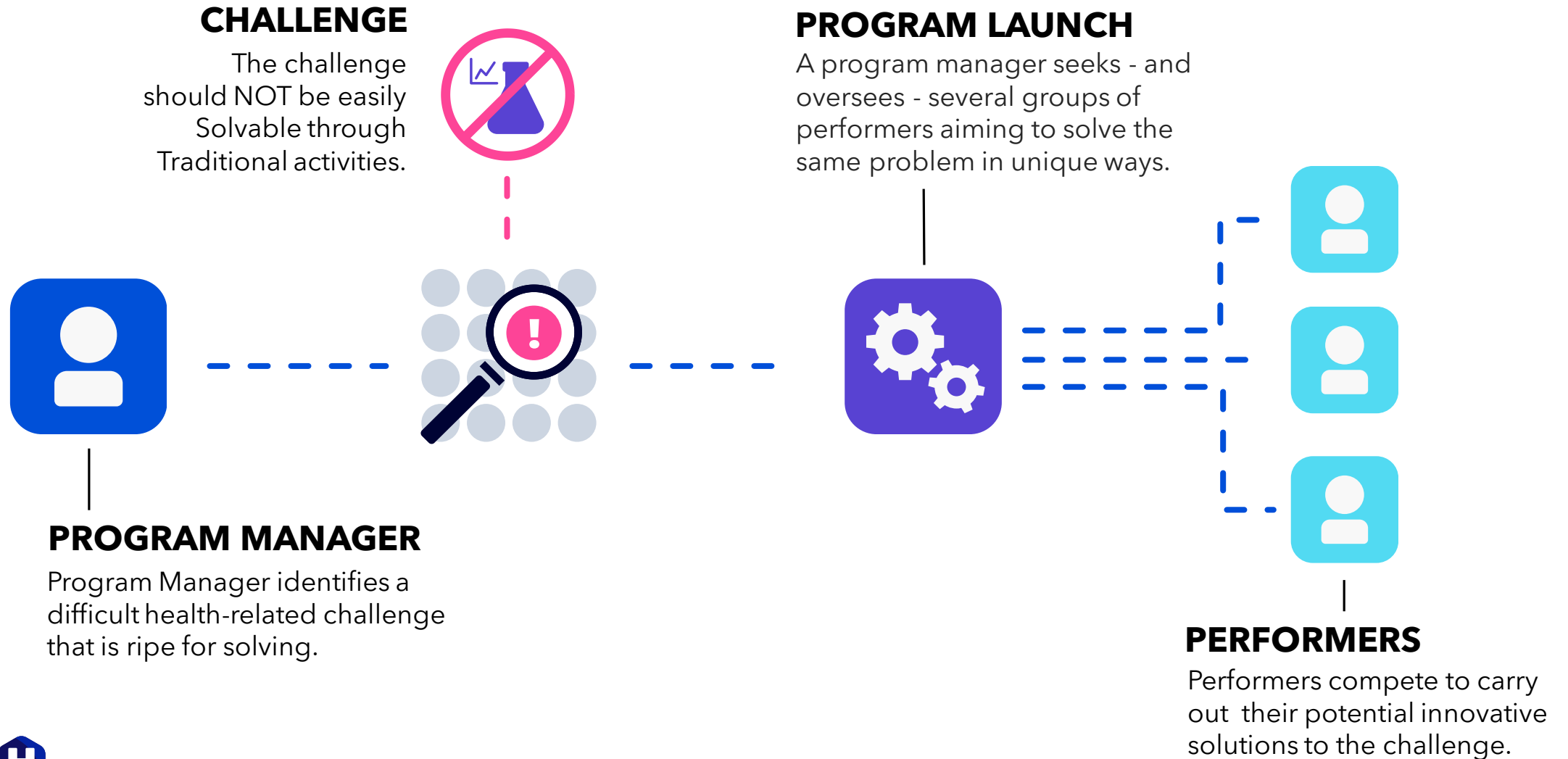
ARPA-H Organization within HHS



ARPA-H At-a-glance

- \$1B Initial budget to start
- Independent component of HHS within NIH, reporting directly to HHS Secretary
- No internal research labs; disease agnostic
- Program Manager driven ideas and decision-making
- Lean and nimble management structure
- High Risk/ High Consequence Research

ARPA Model: Program Formation

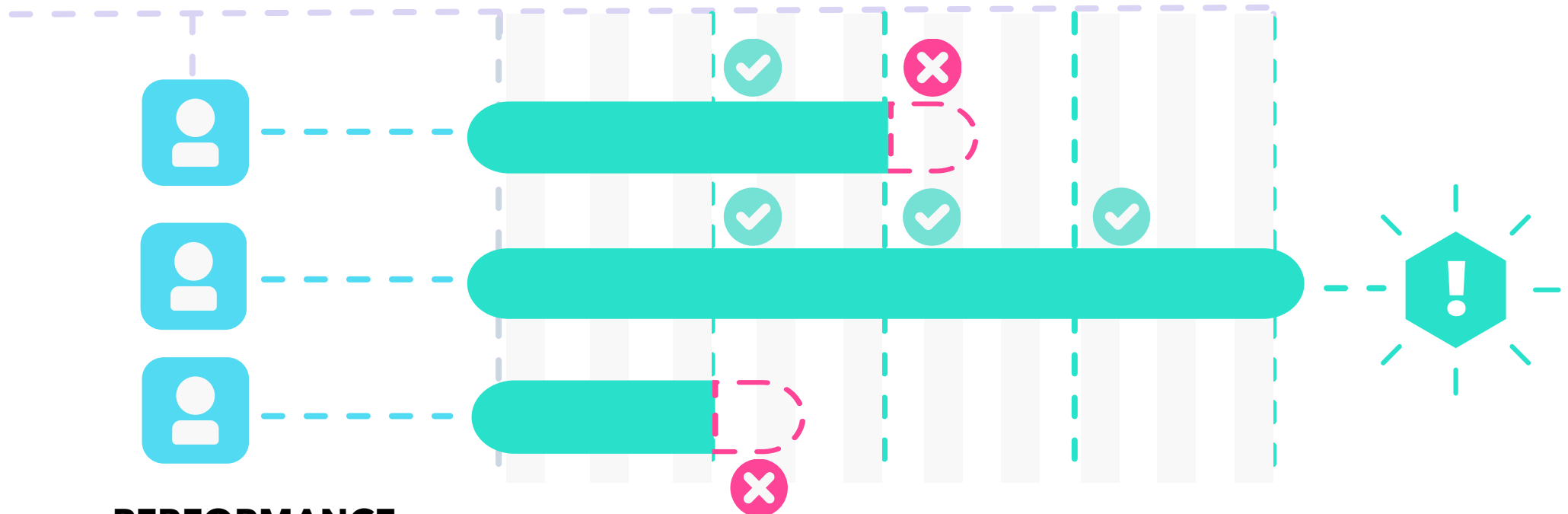


ARPA Model: Support and Evaluation



SUPPORT

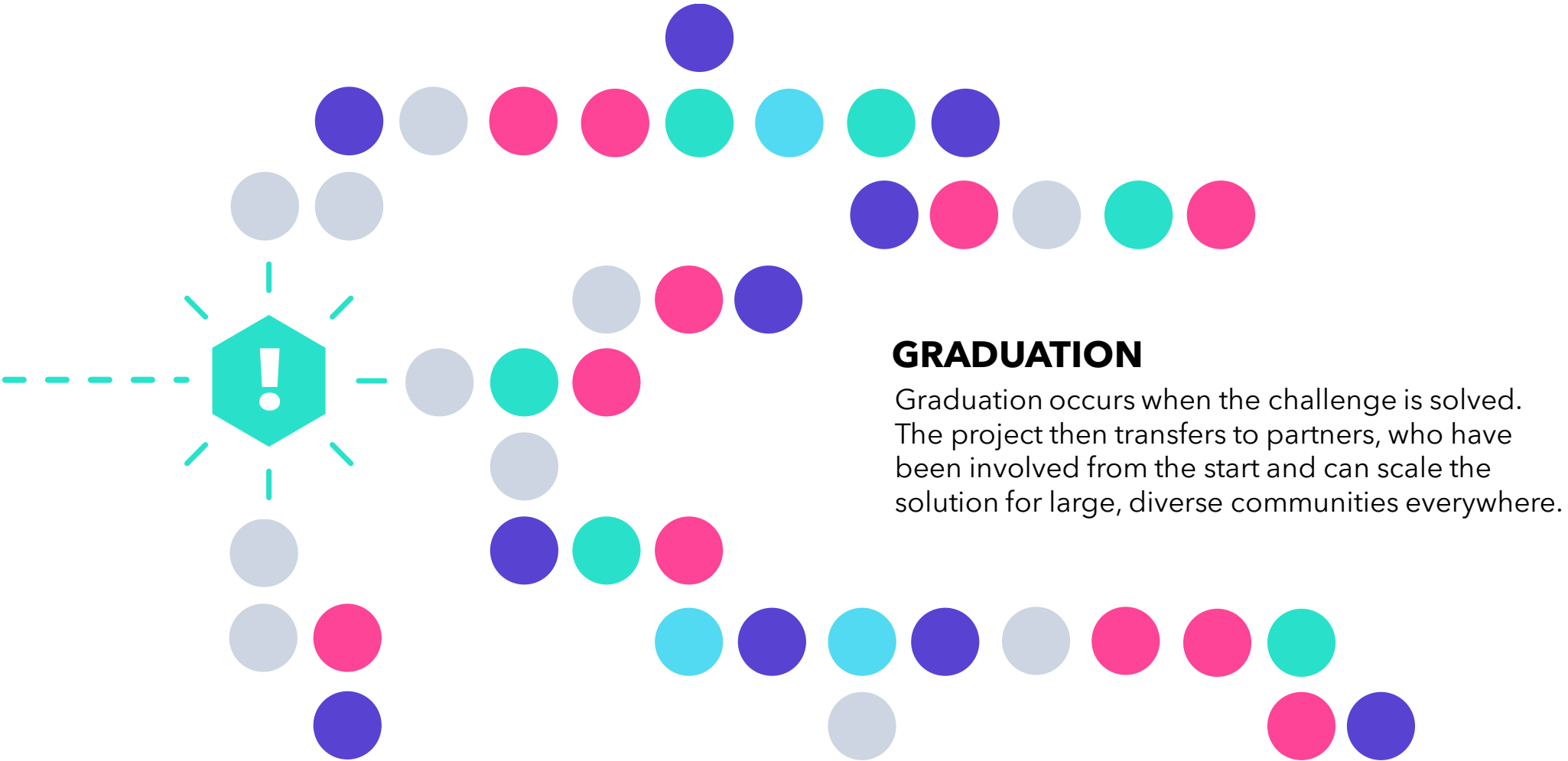
Support for ARPA-H programs comes from funding, Program Managers, partners, and ARPA-H offices to ensure the best chance of success throughout the process.



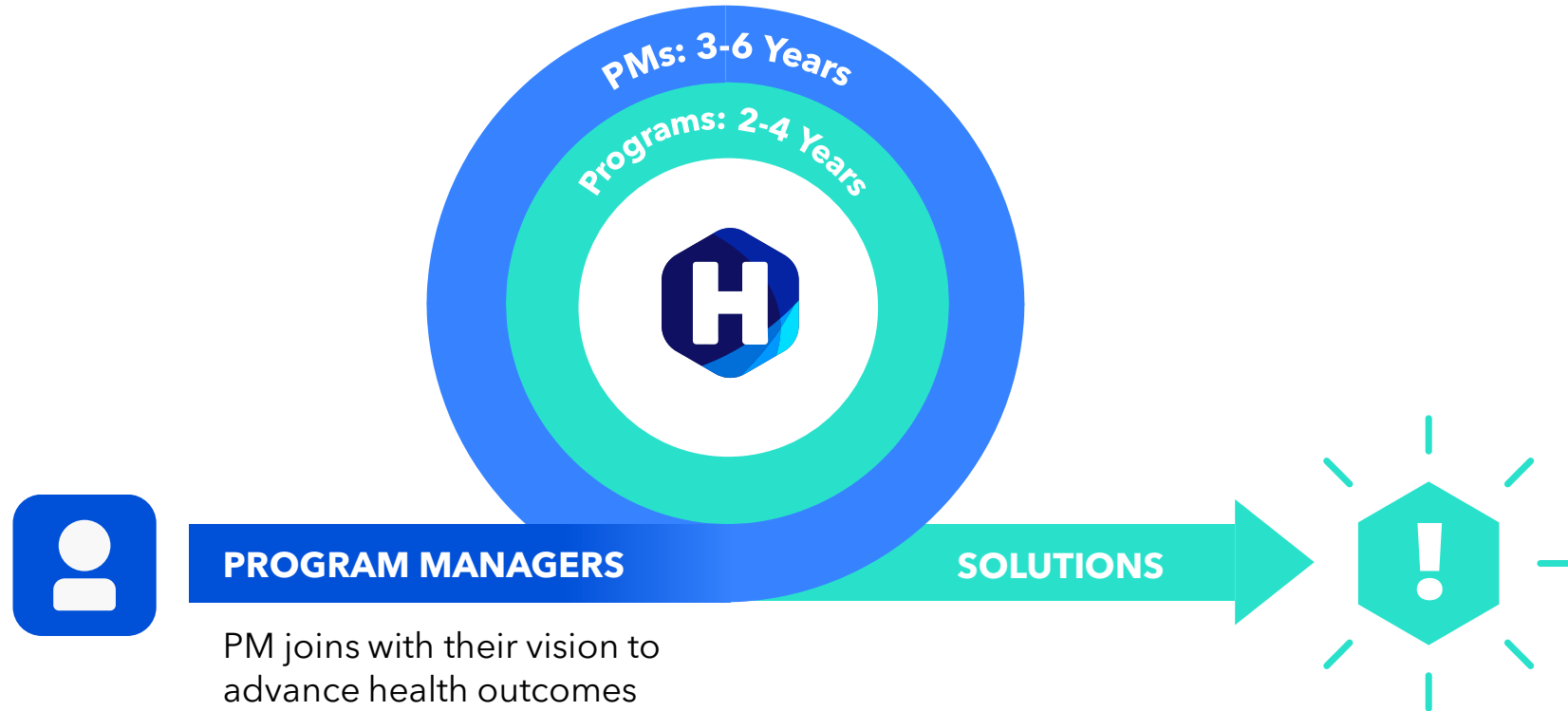
PERFORMANCE

Performance is assessed regularly. If results fail to measure up, a performer's work may be stopped, while more successful performers continue. Valuable lessons are learned and shared from each project.

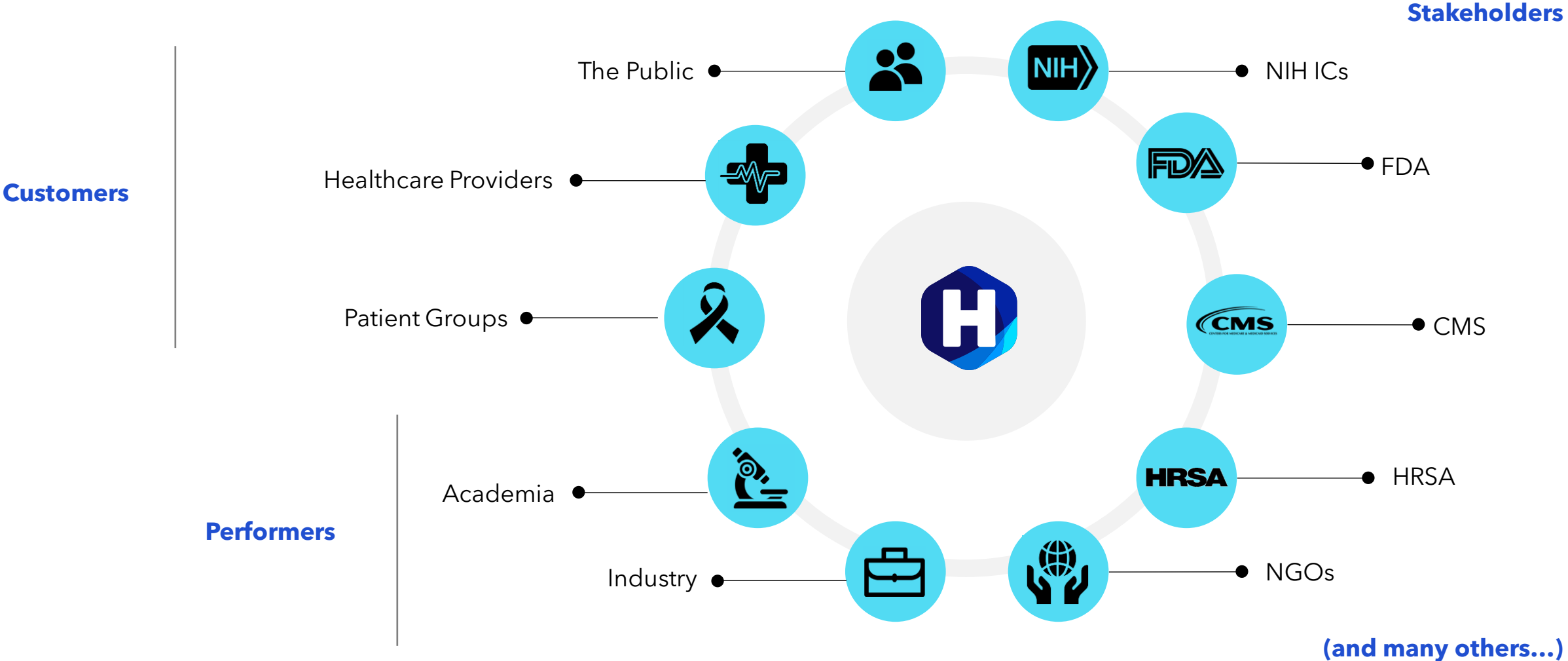
ARPA Model: Transition



The Program and Program Manager Flywheel



ARPA-H Health Ecosystem



Program Lifecycle

From ideas to solutions in the real world



DESIGN PROGRAMS

- ARPA-Hard and well-defined problems in health
- Heilmeier Framework
- High risk/High consequence
- Stakeholder Insights



BUILD A PERFORMER TEAM

- Solicit Solutions from the community
- Find the best non-traditionals, industry, and academics to solve
- Build new coalitions



EXECUTE & MEASURE

- Active program management against metrics; PM = CEO
- Stakeholder engagement throughout to ensure transition
- Pivot resources when needed



LEARN & GROW

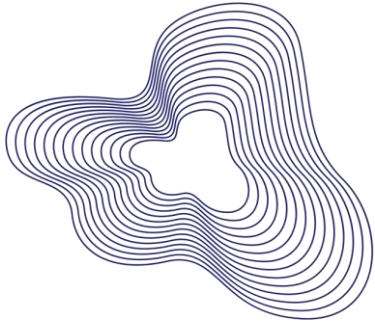
- Capture and share insights
- Technical honesty
- Advance the state of the art; 10x+ improvement, no incremental change



COMMERCIALIZE & TRANSITION

- Assist company formation or licencing
- Provide mentorship, connections to customers, investors
- De-risk investments

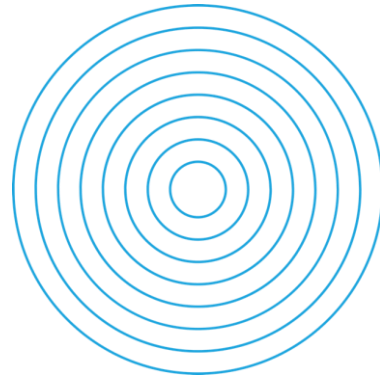
Initial Mission Focus Areas



Health Science Futures

Expanding what's technically possible

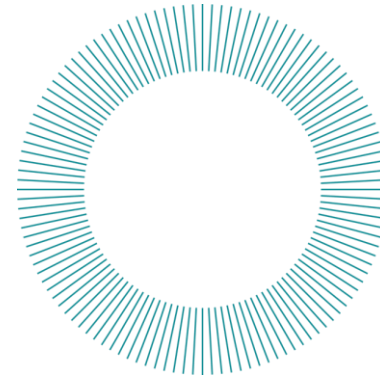
Accelerate advances across research areas and remove limitations that stymie progress towards solutions. These tools and platforms apply to a broad range of diseases.



Scalable Solutions

Reaching everyone quickly

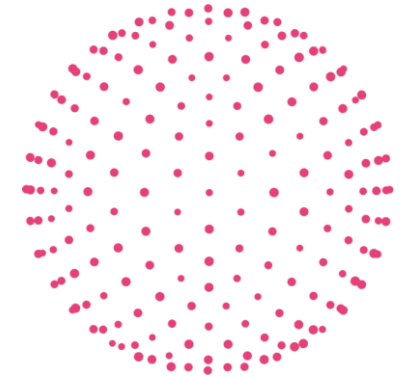
Address health challenges that include geography, distribution, manufacturing, data and information, and economies of scale to create programs that result in impactful, timely, and equitable solutions.



Proactive Health

Keeping people from being patients

Preventative programs will create new capabilities to detect and characterize disease risk and promote treatments and behaviors to anticipate threats to Americans' health, whether those are viral, bacterial, chemical, physical, or psychological.



Resilient Systems

Building integrated healthcare systems

Create capabilities, business models, and integrations to weather crises such as pandemics, social disruption, climate change, and economic instability. Systems are sustained between crises—from the molecular to the societal—to achieve better health outcomes.

Program Manager

A "career-defining opportunity"

THE POSITION

- Timebound (3 - 6 years)
- Competitive salary
- PMs diverse in geography, demographics, experience, and topic
- **Full business and technical team support** for day-to-day program management, market assessments, transition, budget, human-centered design, etc.
- **Resources and opportunity to change the future of health**
- **Responsibility to identify well-defined problems in health**, and assemble teams from industry, academics, and government to solve.

THE OPPORTUNITY

"My time as a DARPA PM was probably **one of the most inspiring periods of my professional career.** I cannot think of a more noble endeavor than to work as a PM for the newly created ARPA-H to solve the grand health challenges that society faces."

Darryll J. Pines, Ph.D., NAE



Program Managers

What are the Phenotypes of these Rational Risk Takers?

Uncommon people with common traits

RECOGNIZED EXPERTISE

SERIOUS DRIVE

INSTATIABLE CURIOSITY

NO FEAR OF FAILURE

INTERDISCIPLINARY TRACK RECORD

TECHNICAL HONESTY



Different Approaches and Career Stage

THE PROBLEM SOLVER

Motivated by personal experience; can't let it go.

THE ROOKIE

Early Career. Unbiased, looks at the world with fresh eyes.

THE DREAMER

Intensely curious about how the world works, motivated by search for objective facts/truth.

THE STATUS QUO CHALLENGER

Mid-career. Frustrated by the limits of the existing system.

THE TINKERER

Intrinsic desire to build and experiment. Cares about application, not theory.

THE SAGE

Late Career. Experience yields deep understanding.

ARPA-(H)eilmeier Questions

Towards a Well-Defined Problem

- 1 What are you trying to do? What health problem are you trying to solve?
- 2 How does this get done at present? Who does it? What are the limitations of present approaches?
- 3 What is new about our approach? Why do we think we can be successful at this time?
- 4 Who cares? If we succeed, what difference will it make?
- 5 What are the risks? That may prevent you from reaching your objectives? Any risks the program itself may present?
- 6 How long will it take?
- 7 How much will it cost?
- 8 What are our mid-term and final exams to check for success?
- 9 To ensure equitable access for all people, how will cost, accessibility, and user experience be addressed?
- 10 How might this program be misperceived or misused (and how can we prevent that from happening)?

To Define Success

Solutions are **NOT** research grants.

At ARPA-H, our Program Managers identify a well-defined problem to pursue through the program life cycle to bring solutions forward that:



Survive in the wild

Real people **want** them and enthusiastically **adopt** them.



Separate the improbable from the impossible

Remove the barriers of today's technologies and systems.



Deliver better health to everyone

The healthy, the sick, providers, hospitals, all 50 states, the world...

Program Managers will use flexible contracting vehicles, including Cooperative Agreements, Contracts, and Other Transactional Authorities to create these solutions.

Project Accelerator Transition Innovation Office (PATIO)

Increasing the odds - at each step - that solutions can "survive in the wild"

PROGRAM LIFECYCLE



PROGRAM DESIGN

- Support PM to find opportunities and gaps
- Market Assessment
 - Human-centric design

BAA DEVELOPMENT

- Who are possible performers? Innovation Hubs?
- VC style due-diligence
- Validate transition potential

EARLY PROGRAM PERFORMANCE

- De-risk for investors
- Design MVPs to drive adoption
- Demystify regulatory process

MATURE PROJECTS

- How to protect IP?
- Help company formation
- Business strategy, legal and marketing services

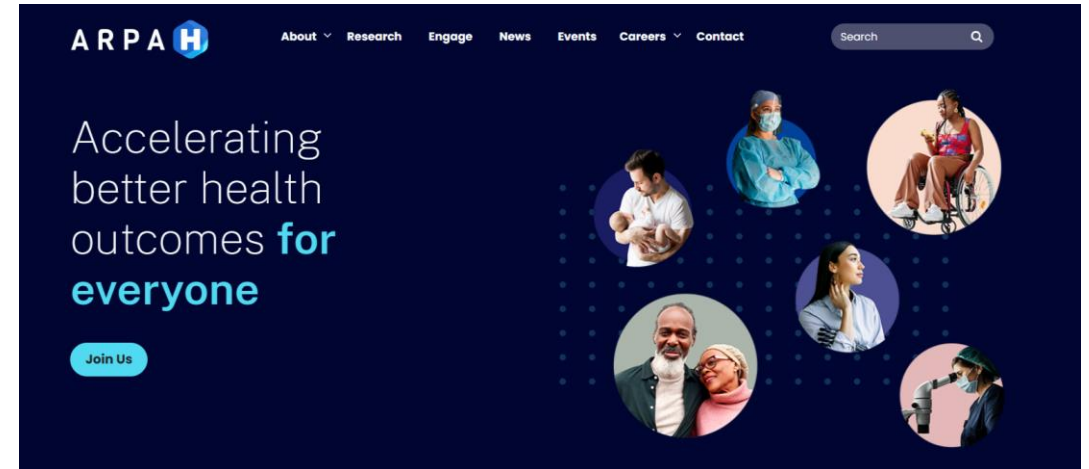
TRANSITION/OUTPUTS SURVIVE IN THE WILD

- SBIR/STTR
- Transition partner/Third-party investment
- Ongoing mentorship
- Access to key customers and investors

Status Update

Recent ARPA-H Milestones

- ✓ **Launch at Howard University**
- ✓ **Website & Social Media Channels**
- ✓ **Identified 4 Mission Thrusts**
- ✓ **Engagements with:**
 - **More than 30** members of Congress, staff, and intragovernmental partners
 - **20 universities'** administrators, vice chancellor/vice presidents of research and associated faculty
 - **More than 10** patient advocacy organizations and professional associations



arpa-h.gov landing page



Howard University event, October 25th



**ARPA-H Associated
Initiatives**

Cancer Moonshot

Cancer Cabinet

Collective action to end cancer as we know it



Office of the First Lady



Gender Policy Council



Office of Management and Budget



Office of Legislative Affairs



Office of Public Engagement



Office of Science and Technology Policy



Domestic Policy Council



ARPA-H in the Context of the Moonshot

● Cancer Moonshot milestone ● ARPA-H milestone

JAN 2016



Obama tasks Biden (VP) to launch effort to "end cancer as we know it" at last State of the Union

Listening Sessions

DEC 2016



The Cures Act is signed into law. The Cancer Moonshot is appropriated

Research, Trials, Patents

MAR 2022



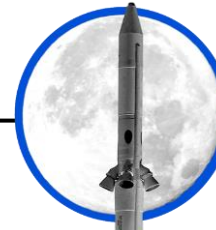
Biden calls on Congress to fund ARPA-H during State of the Union

Listening Sessions



ARPA-H is appropriated with a budget of \$1B over 3 years

JUL 2022



New goals are set for the Cancer Moonshot 2.0

AUG 2022



New NCI Director Announced

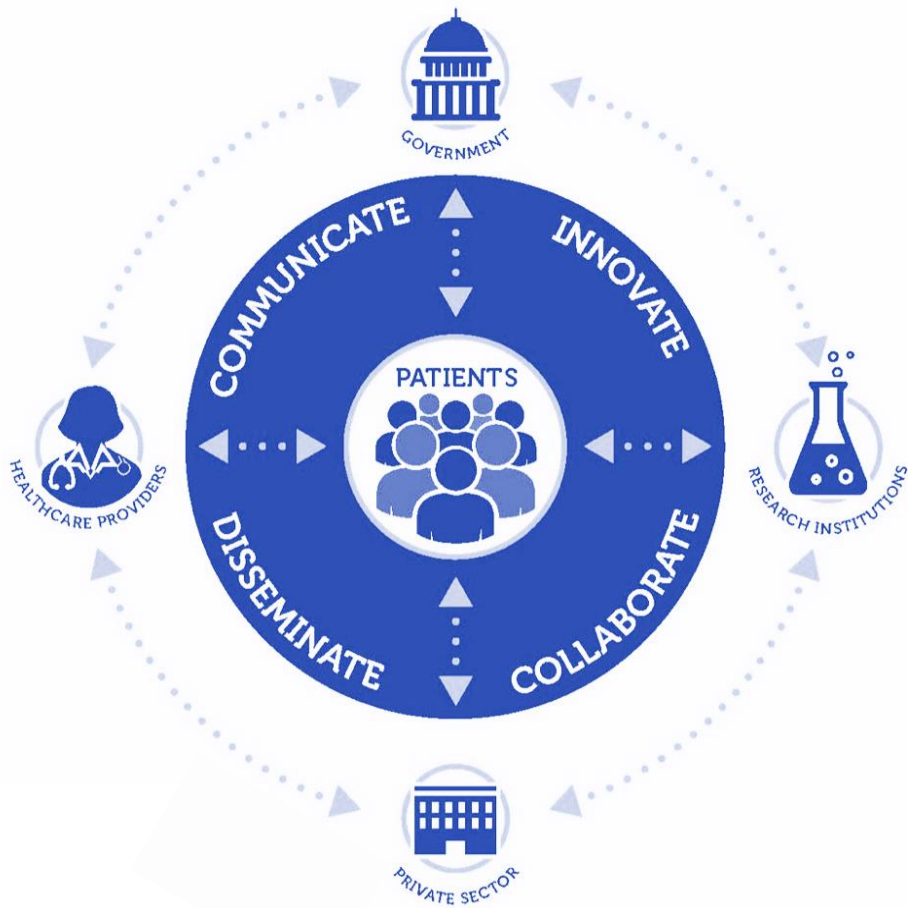
SEP 2022



Inaugural ARPA-H Director announced at Cancer Moonshot event - Agency will expand the toolkit to combat ALL diseases

Cancer Moonshot

2022 Strategic Priorities



1

Close the screening gap

2

Address environmental exposure

3

Decrease impact of preventable cancers

4

Bring cutting edge research to patients

5

Support patients and caregivers

How Might ARPA-H Contribute to the Moonshot?

ARPA-H can appoint a Cancer Moonshot Champion to:

- **Identify** internal efforts across mission offices that utilize the whole of ARPA-H that are aligned to Cancer Moonshot
- **Engage** stakeholders on behalf of the government
- **Collaborate** with Cancer Moonshot leaders in OSTP, NIH, and across government

PMs can:

- **Leverage** infrastructure (e.g., data, networks) and implementation pathways
- **Translate** ongoing research efforts into capabilities for researchers or patients
- **Solve** problems prioritized in the Moonshot that can't be solved otherwise

Striking the right balance:

Collaborating to seize the moment, while maintaining the **flexibility** for ideas and domains beyond cancer.

Examples of Notional Programs Addressing Moonshot Strategic Priorities



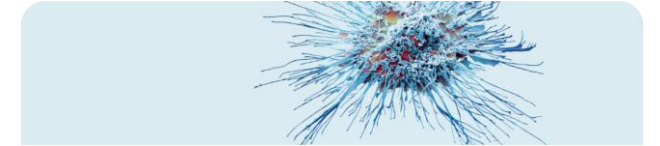
Close the screening gap

What if new at-home screens meant you didn't need to go to the hospital for a colonoscopy anymore?



Address environmental exposure

What if wearable consumer devices also gave you a data readout of environmental risk over time?



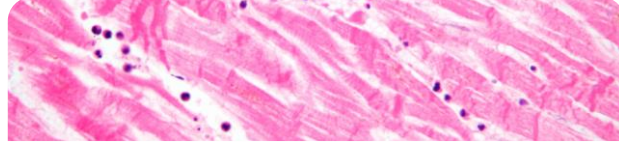
Decrease impact of preventable cancers

What if we had new tools to measure and modulate microenvironments in the body to prevent metastasis?



Support patients and caregiver

What if your electronic health record advocated for you even when you weren't at your doctor's office?



Bring cutting-edge research to patients

What if AI/ML tools could readily interpret 3D histopathology of specimen and the data could be shared instantly with doctors to improve patient care?



Address inequities

What if we could ensure that every community in America - rural, urban, Tribal, and everywhere else - has access to cutting-edge cancer diagnostics, therapeutics, and clinical trials?

Notional Example: **Digital Histopathology Capability**

Cancer priorities at ARPA-H are cross-cutting **within** programs

Notional Program Problem:

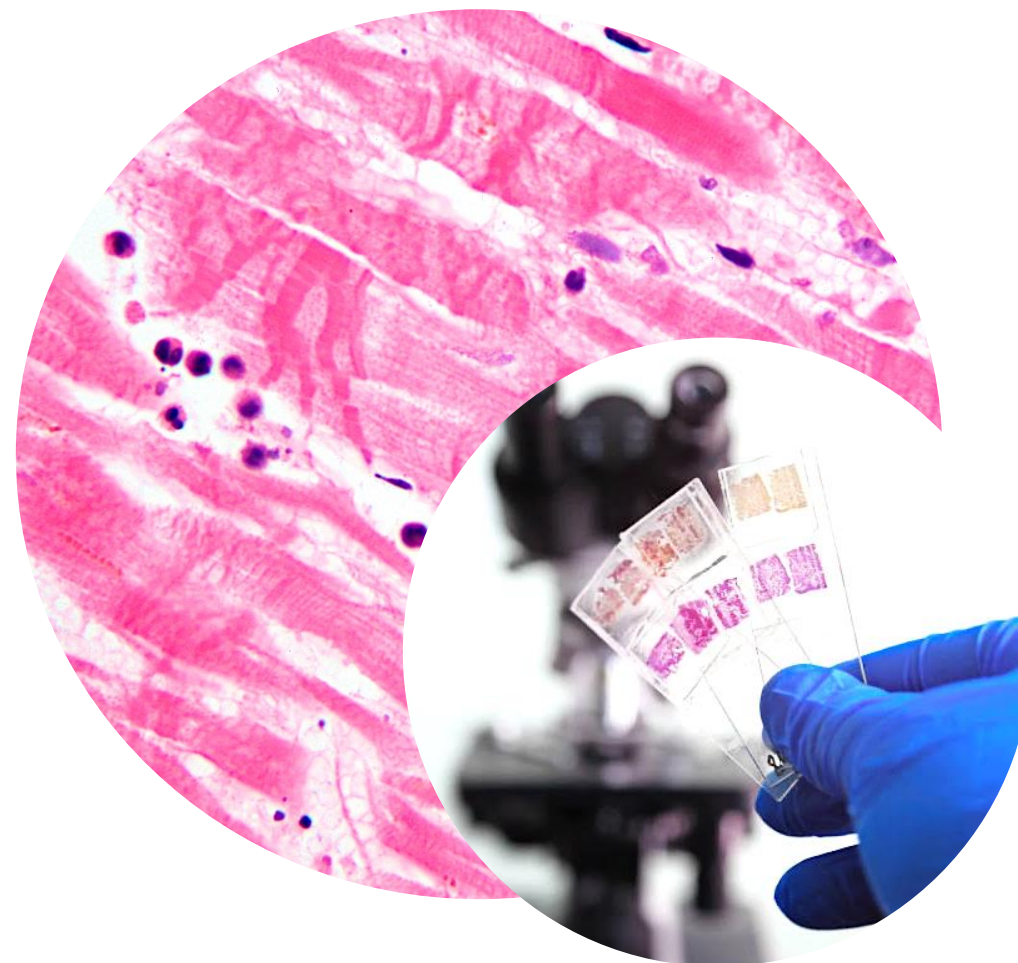
Current histopathology practice is manual, requires an expert in the loop, is costly, and data is not accessible to share broad insights to improve patient care.

Technical areas include:

- Design and develop novel multi-omic histopath assays
- AI, ML, and data technology for automated diagnostics and 3D tissue characterization
- Data integration into care pathways and digital advocacy

Applications/Indications include:

Proofs of concept for metastatic cancers, neurodegenerative disease, and wound healing



ARPA-H Call to Action



Apply - Our top priority is to **hire the Program Managers** that will bring well-defined problems to ARPA-H and build the teams to solve them

<https://arpa-h.gov> | careers@arpa-h.gov



Engage - We are actively engaging research, patient, and stakeholder, communities; we want to hear from you!

inquiries@arpa-h.gov



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