Program Primer: NIH's High-Risk High Reward Research Funding

August 11, 2021

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Becky Miller, Ph.D. - *Program Officer*
Ellie Murcia, M.Ed. – *Program Specialist*
Makyba Charles-Ayinde Ph.D. - *Health Science Policy Analyst*

Office of Strategic Coordination
Division of Program Coordination, Planning, and Strategic Initiatives
Office of the Director

National Institutes of Health

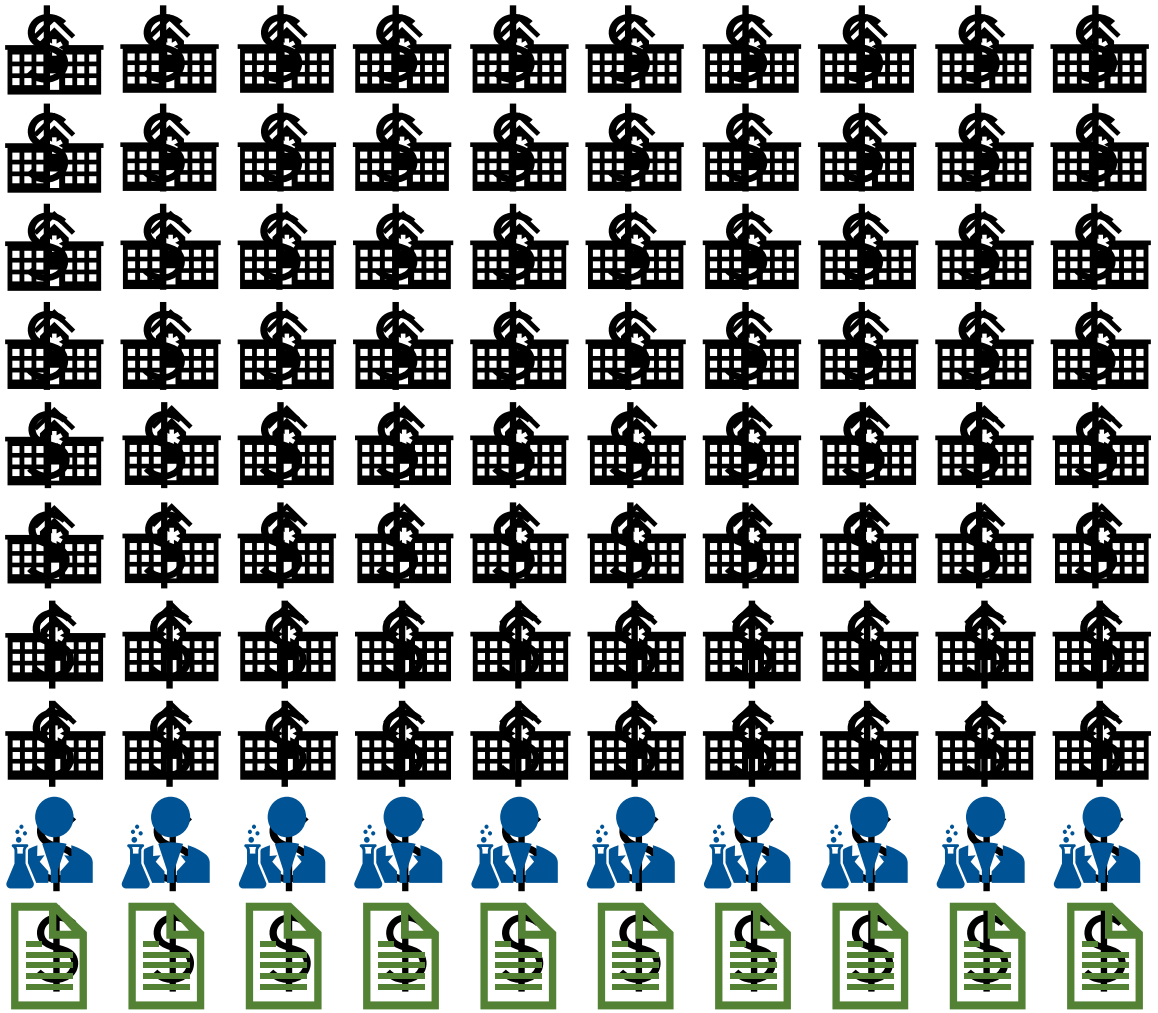
Turning Discovery Into Health

To enhance health, lengthen life, and reduce illness and disability

National Institutes of Health
Turning Discovery Into Health

To enhance health, lengthen life, and reduce illness and disability

FY2021 - $42.9 Billion



External Institutions

- 50,000 Grants
- 300,000 Researchers
- 2,500 Institutions

NIH Research

- 6,000 Scientists

Administration

National Institutes of Health
27 Institutes & Centers

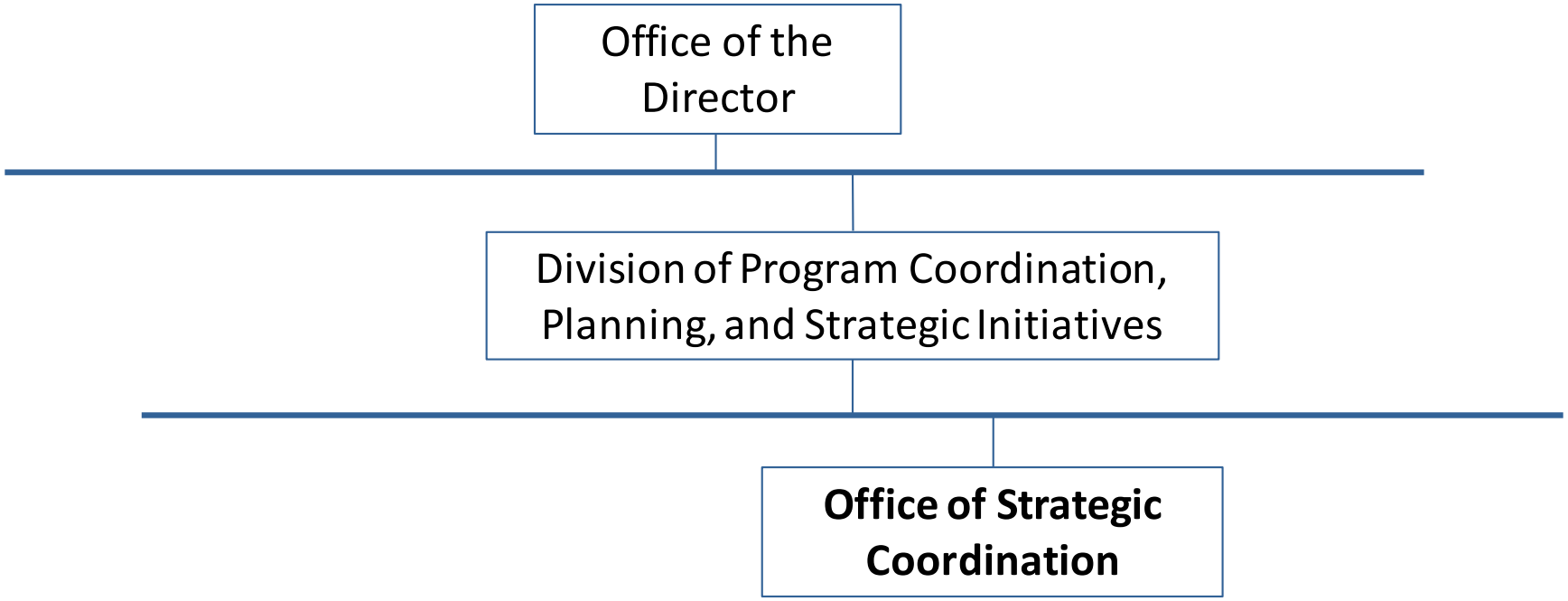
The Common Fund

- Center for Information Technology
- Center for Scientific Review
- Clinical Center
- Eunice Kennedy Shriver National Institute of Child Health and Human Development
- Fogarty International Center
- National Cancer Institute
- National Center for Advancing Translational Sciences
- National Center for Complementary and Integrative Health
- National Eye Institute
- National Heart, Lung, and Blood Institute
- National Human Genome Research Institute
- National Institute of Allergy and Infectious Diseases
- National Institute of Arthritis and Musculoskeletal and Skin Diseases
- National Institute of Biomedical Imaging and Bioengineering
- National Institute of Dental and Craniofacial Research
- National Institute of Diabetes and Digestive and Kidney Diseases
- National Institute of Environmental Health Sciences
- National Institute of General Medical Sciences
- National Institute of Mental Health
- National Institute of Neurological Disorders and Stroke
- National Institute of Nursing Research
- National Institute on Aging
- National Institute on Alcohol Abuse and Alcoholism
- National Institute on Deafness and Other Communication Disorders
- National Institute on Drug Abuse
- National Institute on Minority Health and Health Disparities
- National Library of Medicine

And the Office of the Director!

The Common Fund
Office of the Director

- 2003: **NIH Roadmap for Medical Research** created
- 2006: **Common Fund** created by Congress through 2006 NIH Reform Act
  - Separate appropriation



Dr. Francis Collins, NIH Director

Vision

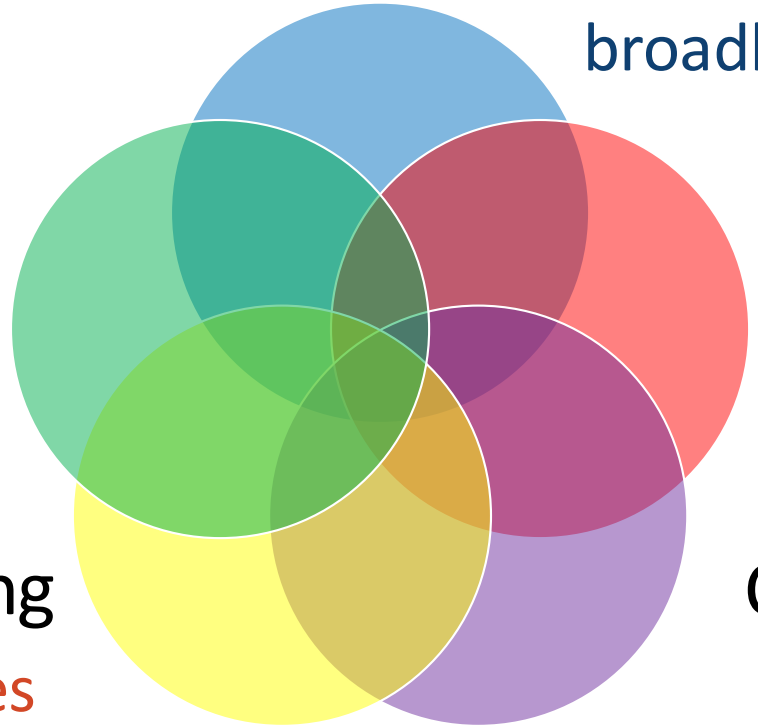
- Address **emerging scientific opportunities** and **pressing challenges**
- **Accelerate the pace of discovery** and **improve translation** of research findings into medical and health interventions
- Function as "**venture capital space**" for high-risk, innovative endeavors (limited-term investments)

The Common Fund
Programs

The Common Fund

Transformative
Exceptionally high and broadly applicable impact

Unique
Provide new solutions to specific challenges



Synergistic
Add value and enable missions of Institutes and Centers

Cross-Cutting
Address complex issues requiring trans-NIH teams

Catalytic
Must achieve a goal with deliverables within 5-10 years

The Common Fund (in the NIH Office of the Director) Current Programs:

The Common Fund

Data/Tools/Methods

- Bridge to Artificial Intelligence (Bridge2AI)
- Cellular Senescence Network (SenNet)
- Gabriella Miller Kids First
- Genotype-Tissue Expression (GTEx)
- Glycoscience
- Human BioMolecular Atlas Program (HuBMAP)
- Illuminating the Druggable Genome (IDG)
- Knockout Mouse Phenotyping (KOMP)
- Metabolomics
- Protein Capture Reagents
- Library of Integrated Network-Based Cellular Signatures (LINCS)
- Science of Behavior Change (SOBS)
- Somatic Cell Genome Editing (SCGE)
- Stimulating Peripheral Activity to Relieve Conditions (SPARC)
- Transformative High Resolution Cryo-Electron Microscopy (CryoEM)

New Types of Clinical Partnerships

- Acute to Chronic Pain Signatures (A2CPS)
- Global Health
- Harnessing Data Science for Health Discovery and Innovation in Africa (DS-I Africa)
- HCS Research Collaboratory
- Nutrition for Precision Health, powered by the All of Us Research program
- Undiagnosed Diseases Network (UDN)

New Paradigms

- 4D Nucleome (4DN)
- Extracellular RNA Communication (exRNA)
- Molecular Transducers of Physical Activity Consortium (MoTrPAC)

Transformative Workforce Support

- Enhancing the Diversity of the NIH-Funded Workforce (DPC/BUILD)
- Faculty Institutional Recruitment for Sustainable Transformation (FIRST)
- High-Risk, High-Reward Research Program
  - Pioneer Award
  - New Innovator Award
  - Transformative Research Award
  - Early Independence Award
- Transformative Research to Address Health Disparities and Advance Health Equity

NIH The Common Fund

High-Risk, High-Reward Research Program

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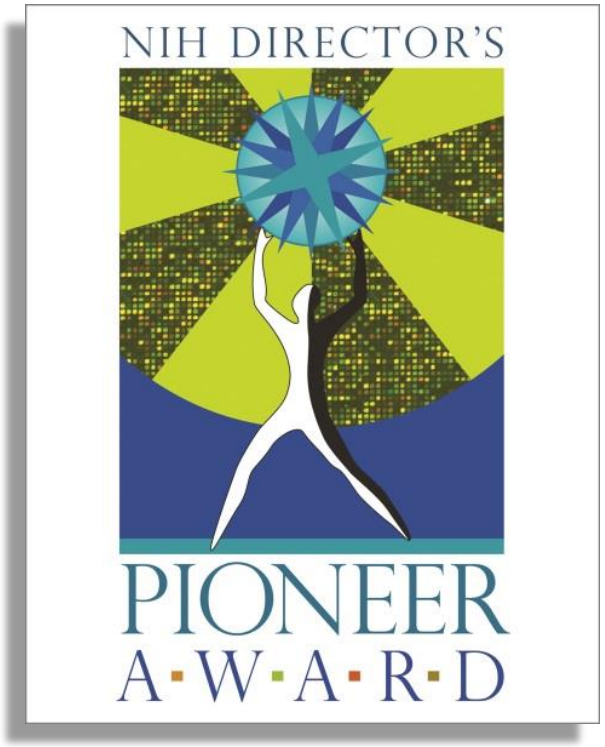

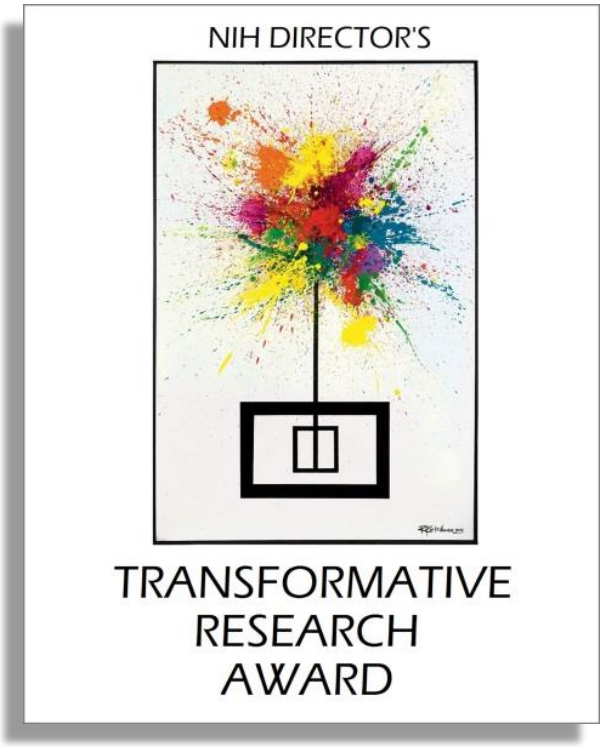

Annual funding opportunities

High-Risk, High-Reward Research Program

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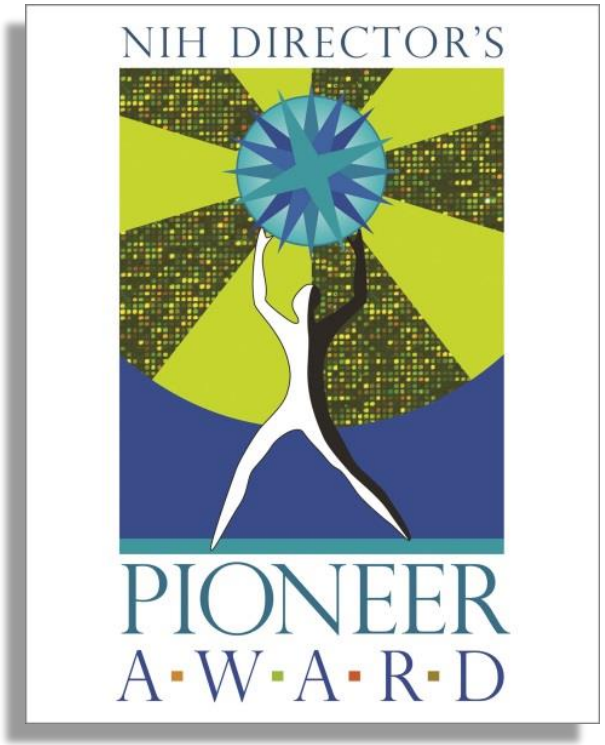

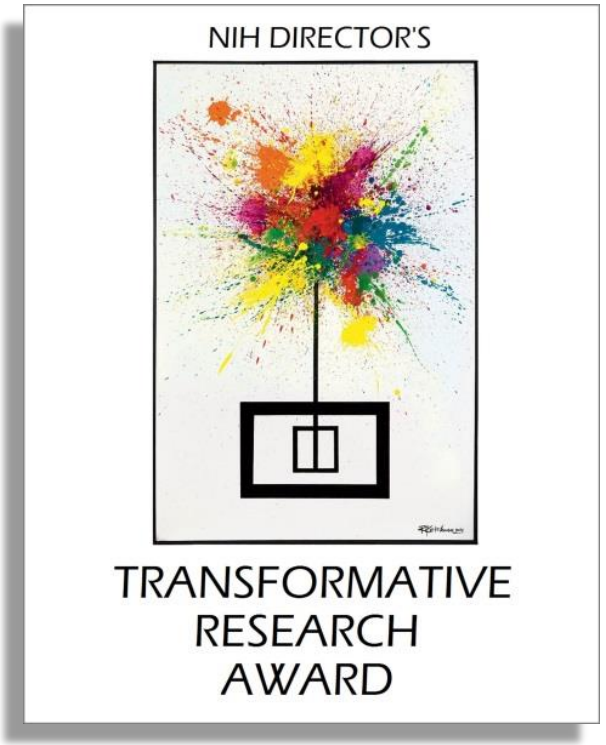

High-risk, high-impact ideas

High-Risk, High-Reward Research Program

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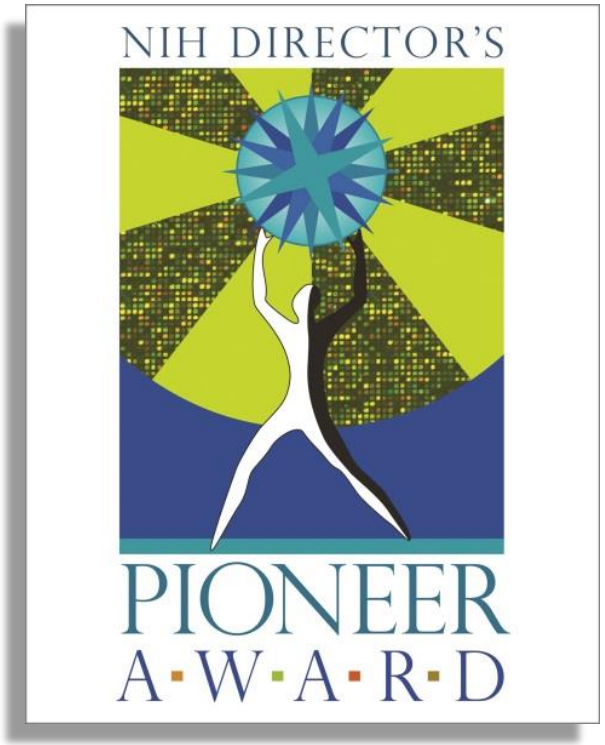

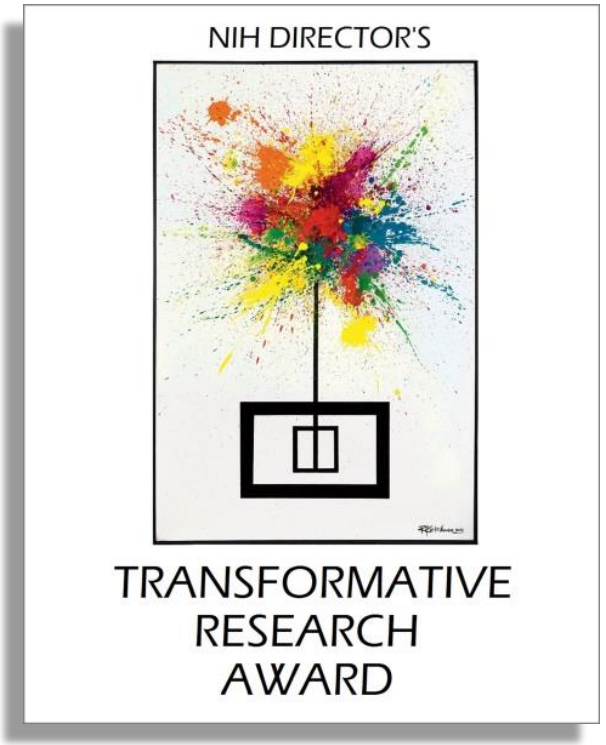

No preliminary data required

High-Risk, High-Reward Research Program

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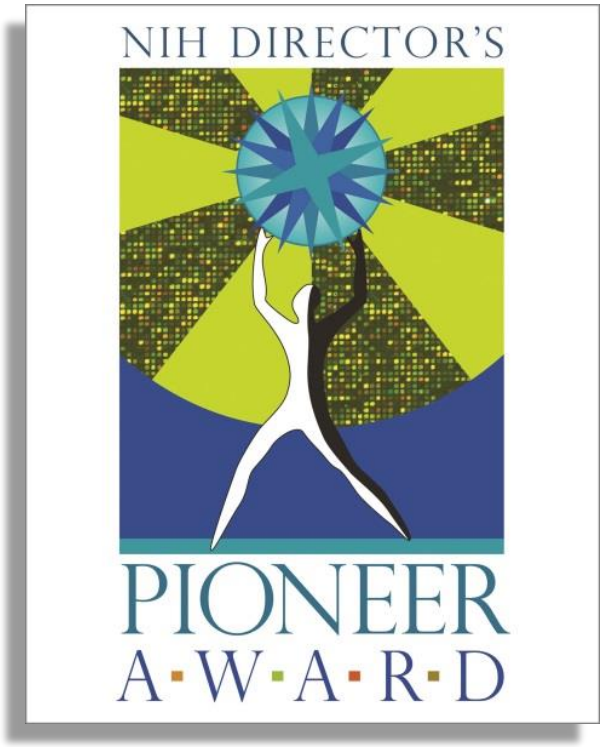

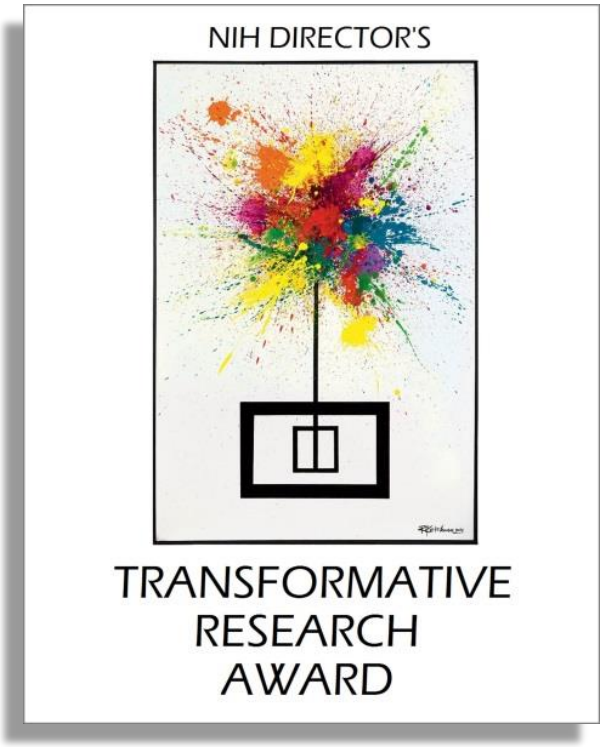

Any topic relevant to NIH mission

High-Risk, High-Reward Research Program

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Chair

James M. Anderson, MD, PhD
OD

Program Leader

Ravi Basavappa, PhD
OSC/DPCPSI/OD

Members

Kristin Abraham, PhD
NIDDK

Hugh Auchincloss, MD
NIAID

David Balshaw, PhD
NIEHS

Abraham P. Bautista, PhD
NIAAA

Eugene Carstea, PhD
CSR

Robert H Carter, MD
NIAMS

Makyba Charles-Ayinde, PhD
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Jennifer Collins, MR
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Christine Colvis, PhD
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NLM

Emmeline Edwards, PhD
NCCIH

Zeynep Erim, PhD
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Rene Etcheberrigaray, MD
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Lia Fleming, MPH
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Nancy Freeman, PhD
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High-Risk, High-Reward Research Program

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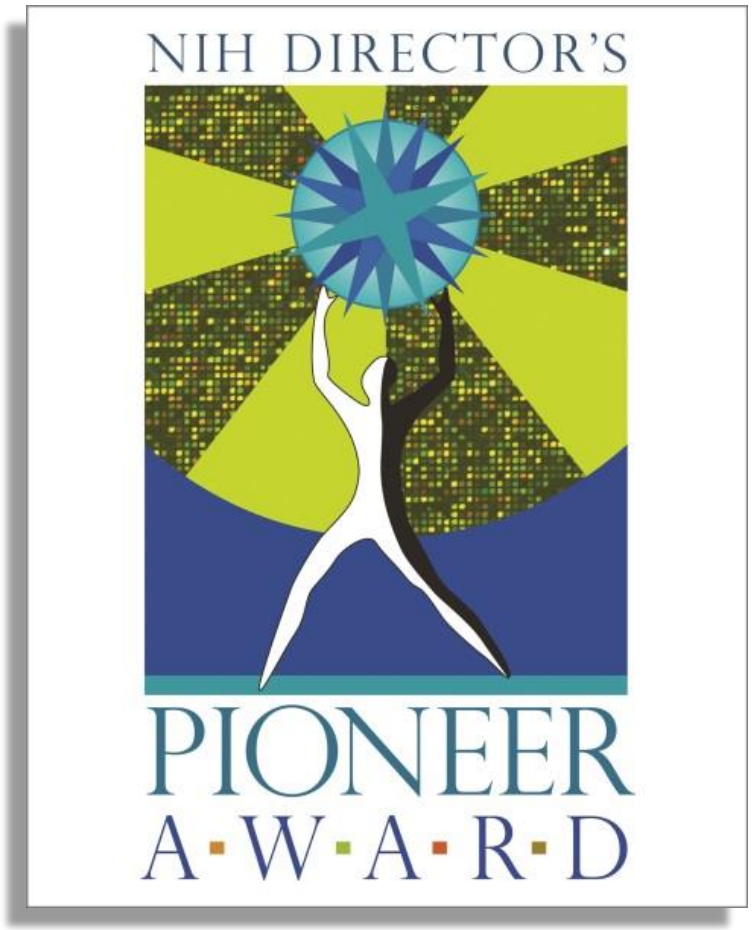


RFA-RM-21-015

Due September 10, 2021

Supports individual scientists with outstanding records of creativity proposing pioneering approaches to major challenges in biomedical and behavioral research

- Started in 2004
- Open to all career stages
- Must be new research direction
- Requires 3 letters of reference
- Commit major portion of research effort (more than 51%)
- No preliminary data required
- Awards of $700,000 per year for 5 years

Pioneer Award

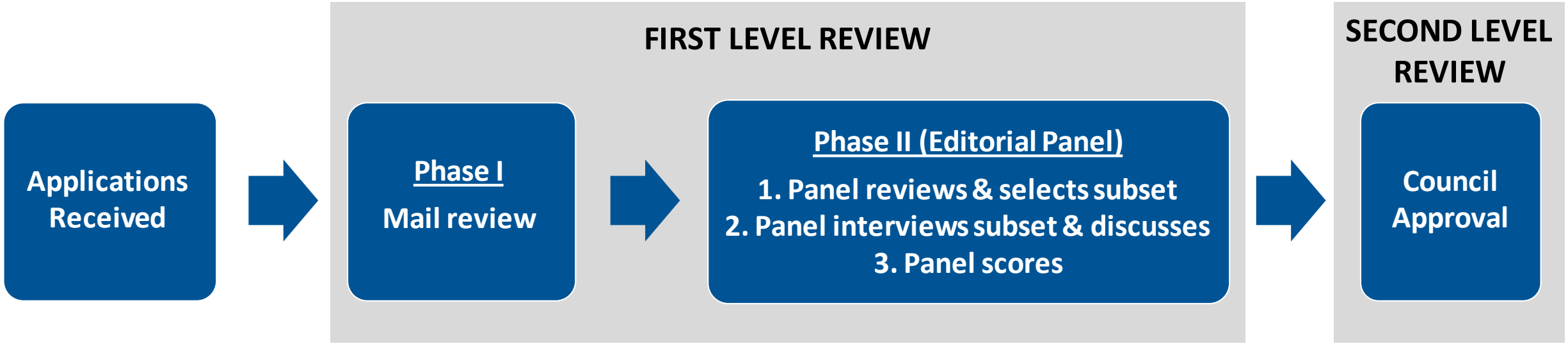
The Common Fund

Application – DP1

	R01	Pioneer Award
Research Strategy Essay	12 pages including detailed experimental plan and preliminary data	3-5 pages: • Scientific problem, significance, and pioneering approach • Evidence for innovativeness • How research direction different • Suitability for award
Budget, Animal, Human Subject Information	Details required	No detailed budget, other information brief
Letters of Support	Encouraged	Not allowed
Research Effort	Depends on project	At least 51% for first 3 years
Letters of Reference	Not allowed	3 required

Pioneer Award

The Common Fund



Pioneer Award

- Conducted by Science and Technology Policy Institute of the Institute for Defense Analysis
- Compared research outcomes of Pioneers to similarly qualified R01 investigators, random R01 sets, and HHMI investigators
- Assessed scientific impact and innovation through bibliometrics and expert analysis
- Found Pioneer research is
  - More impactful than similarly qualified R01 investigators and random R01s and about as impactful as HHMI investigators
  - More innovative than similarly qualified R01 investigators and about as innovative as HHMI investigators

High-Risk, High-Reward Research Program

The Common Fund

RFA-RM-21-016

Due August 20, 2021

Supports unusually creative early career investigators proposing innovative, high-impact research

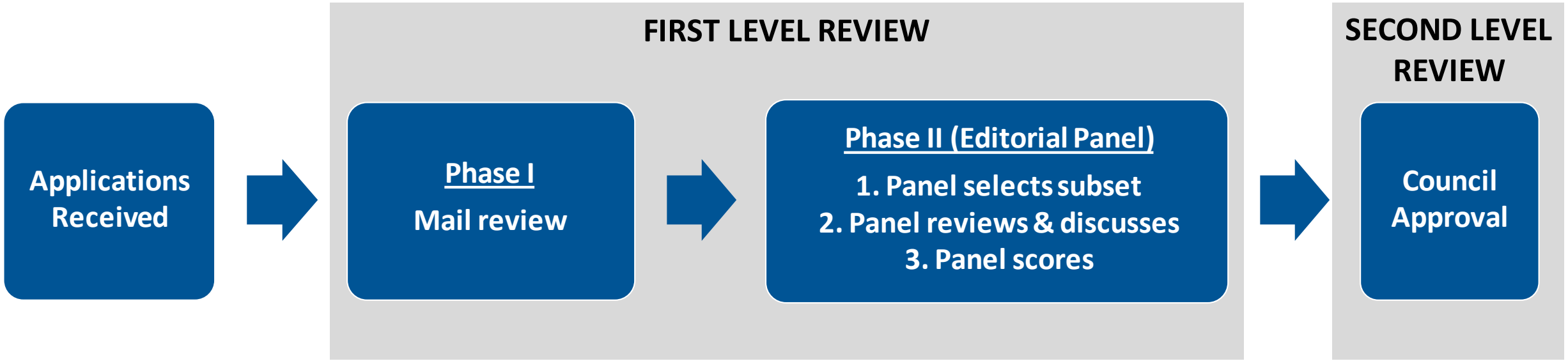
- Started in 2007
- Early Stage Investigator (no NIH R01 or equivalent grant and within 10 years of doctoral degree or clinical training)
- Commit 25% research effort
- No preliminary data required
- Multi-year award – all funds ($1.5 million dc + F&A) disbursed in a three-year and two-year segment

Application – DP2

Research Strategy Essay	10 pages: • Scientific problem, significance, and potential impact • Innovativeness of approach • How risks and challenges will be addressed • Suitability for award • Investigator's qualifications
Budget, Animal, Human Subject Information	No detailed budget, other information brief
Letters of Support	Not allowed
Research Effort	At least 25%
Letters of Reference	Not allowed

New Innovator Award

The Common Fund



New Innovator Award

- Conducted by Science and Technology Policy Institute of the Institute for Defense Analysis
- Compared research outcomes of New Innovators to early stage R01 investigators and non-awarded “finalists”
- Assessed scientific impact and innovation through bibliometrics and expert analysis
- Found New Innovator research is more innovative, risky, and impactful than similarly staged R01 investigators
- New Innovator Award impact on awardees’ careers are similar to R01 impact for early stage R01 investigators

High-Risk, High-Reward Research Program

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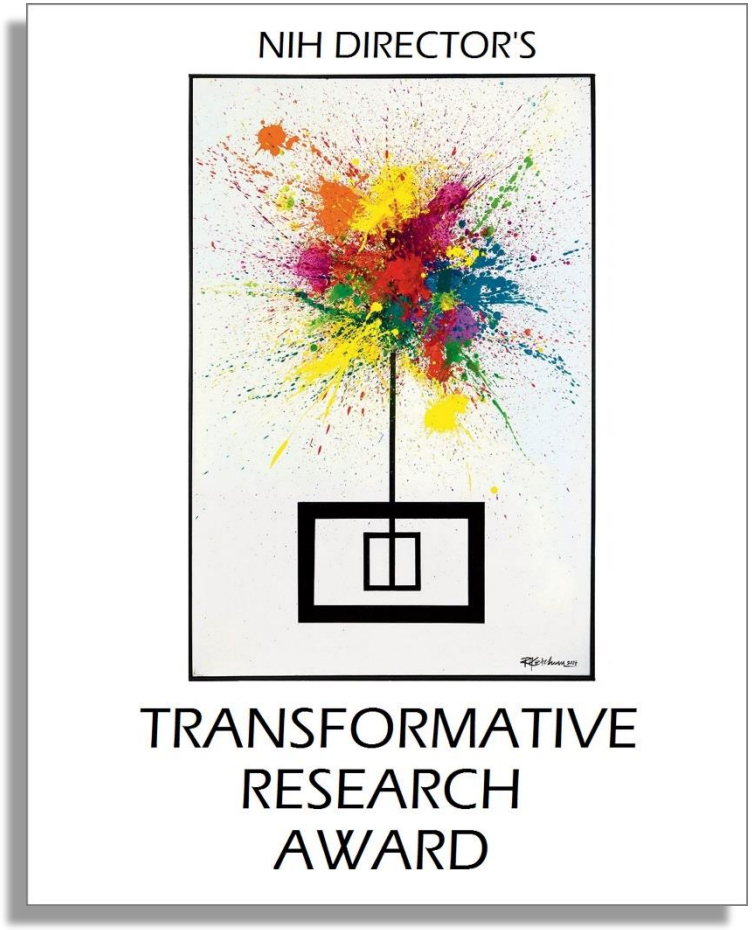


RFA-RM-21-017

Due September 1, 2021

Supports exceptionally innovative or unconventional research projects with the potential to create or overturn fundamental paradigms

- Started in 2009
- Open to individuals or teams at all career stages
- No preliminary data required
- Flexible budgets
- No prior approval required for large budget requests
- Anonymized review process

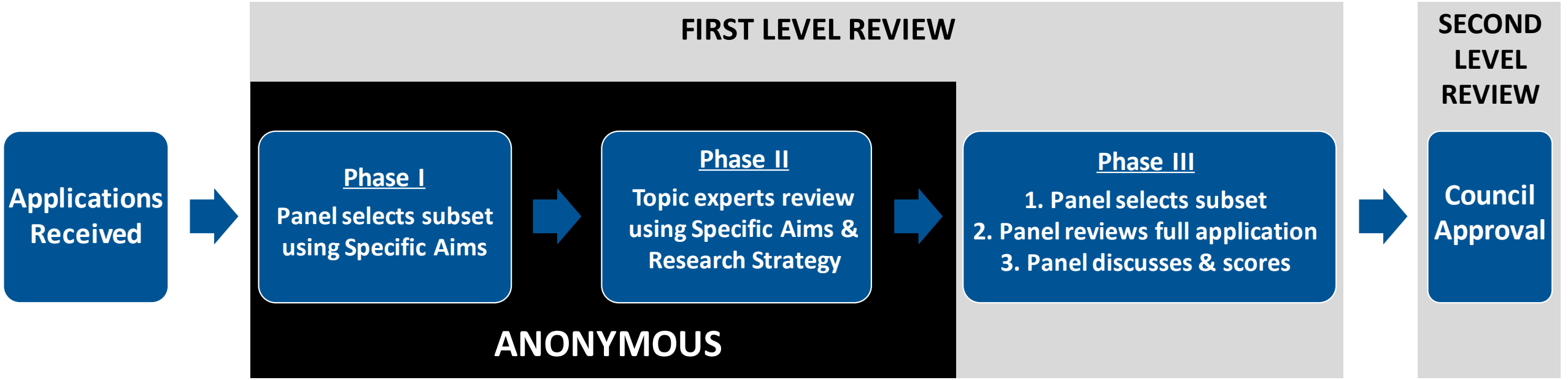
Anonymized Specific Aims & Research Strategy

- No information allowed that could be used to identify the PI(s), other participating individuals, or institutions
- Must not include:
  - Names of any individuals or institutions
  - Mention of any honors or awards
  - Hyperlinks or references to any investigator attributes or accomplishments
  - Citations with source information (numeric citations only)
  - Any other text from which the identity of any participating individual or institution can be reasonably inferred
- Inclusion of such text will result in the application being withdrawn

Transformative Research Award

The Common Fund

Applications from the two FOAs will be reviewed at the same time using the same process



Transformative Research Award

- Conducted by Science and Technology Policy Institute of the Institute for Defense Analysis
- Compared research outcomes of TRAs to similarly qualified R01 investigators and NDPA investigators
- Assessed scientific impact and innovation through bibliometrics and expert analysis
- Found Transformative Research Awardee research is
  - More transformative potential than similarly qualified R01 investigators and about as transformative as NDPA investigators
  - More impactful than similarly qualified R01 investigators

High-Risk, High-Reward Research Program

The Common Fund

RFA-RM-21-018

Due September 3, 2021

Enables outstanding early career scientists to move rapidly into independent research positions by skipping the traditional postdoc

- Started in 2011
- Complete terminal research degree or clinical training between June 1, 2020 and September 30, 2022
- In non-independent position at time of application
- Commit 9.6 months each year to research
- Requires independent position from host institution
- Limit of 2 applications per institution
- No preliminary data required
- Awards up to $250,000 per year for 5 years

Early Independence Award

The Common Fund

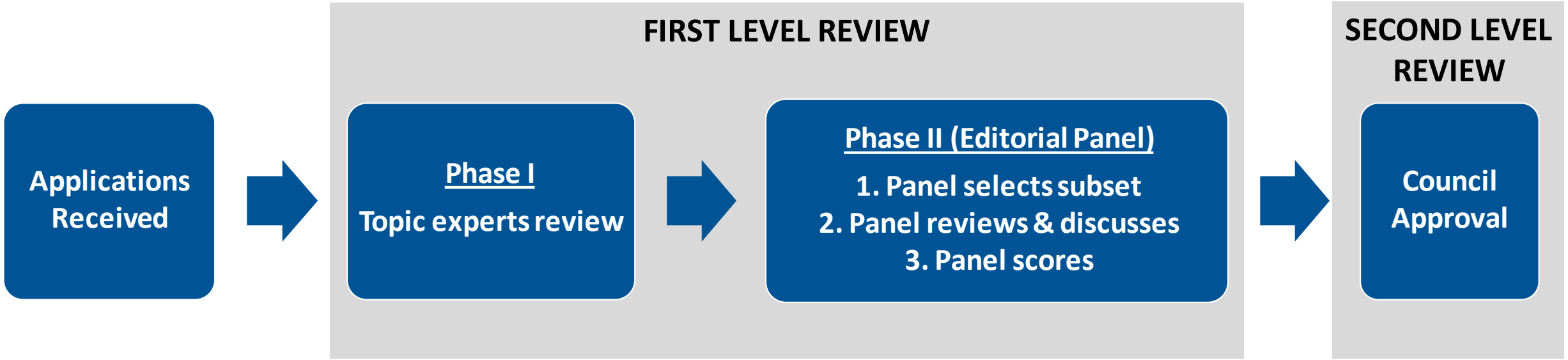
Application – DP5

Application Limit	2 applications per institution
Research Strategy Essay	12 pages: • Scientific challenge and significance • Innovativeness of approach • Investigator's qualifications • Plans for development
Facilities & Other Resources	Institutional support detailed
Budget Information	Modular budget
Letters of Support	Should be included
Research Effort	80% for first 2 years
Letters of Reference	3-5 required

Early Independence Award

The Common Fund

Applications from the two FOAs will be reviewed at the same time using the same process



Early Independence Award

Program Administration

- Remain “OD” awards with Becky Miller as Program Officer
- Assigned “affiliated” Program Officer from most scientifically relevant NIH Institute/Center
- Site visit during first year

Early Independence Award

- Conducted by Science and Technology Policy Institute of the Institute for Defense Analysis
- Compared Early Independence Awardees to NIH Early-Stage Investigators (ESI)
- Assessed research output and career impact through bibliometrics and expert analysis
- Found that Early Independence Awardee readiness to launch independent careers was similar to ESIs
- Early Independence Awardee research output was the same or higher based on type of bibliometric data when compared to ESIs

High-Risk, High-Reward Research Program

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Ijeoma Opara

2020 Early Independence Award

Using community-based participatory research to examine the complex relationships between neighborhoods, substance use, and mental health among urban youth

High-Risk, High-Reward Research Program

Jessica Schleider

2019 Early Independence Award

Creating effective single-session interventions based on symptoms to treat youth with major depression

High-Risk, High-Reward Research Program

Marina Picciotto

2019 Pioneer Award

Determining how the brains of high-dose opiate addicts regulate the body to promote survival in familiar environments

Join us!

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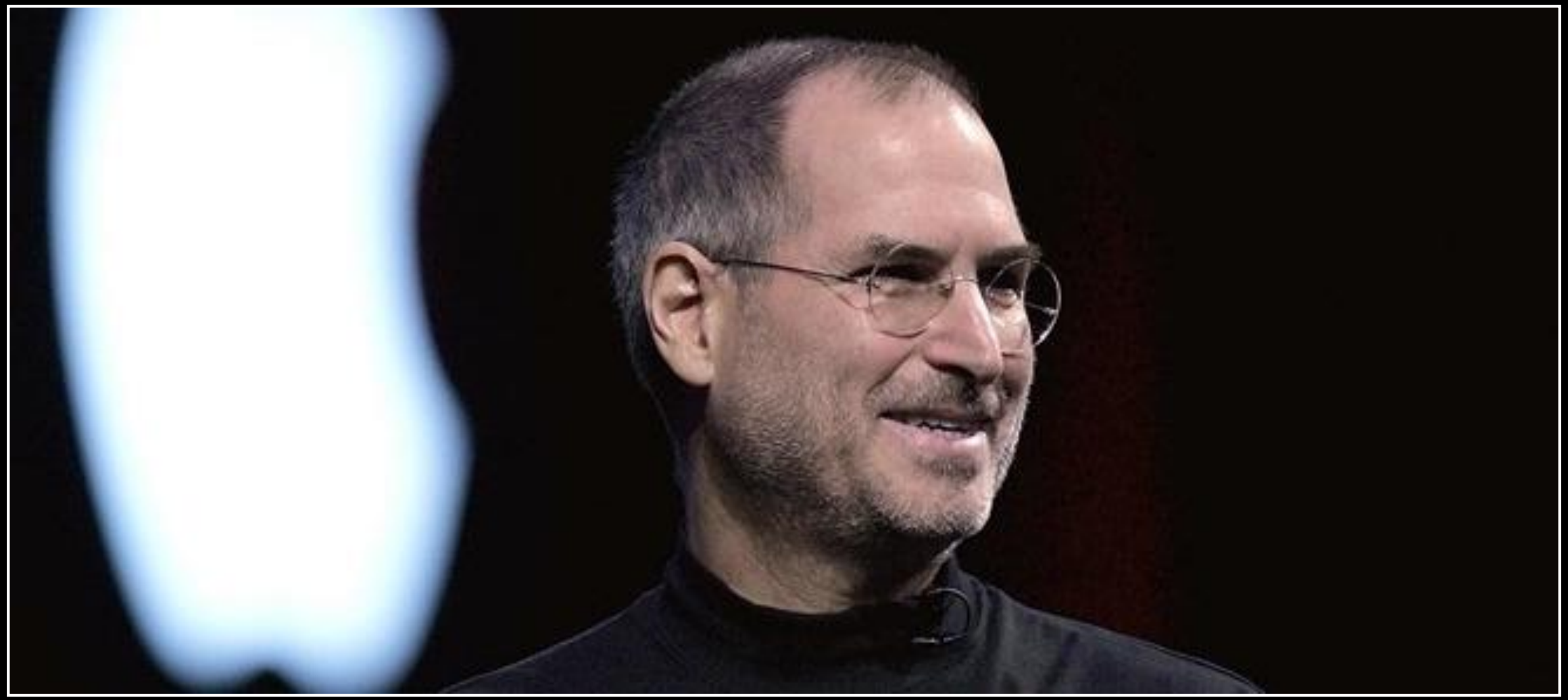

“The people who are crazy enough to think they can change the world are the ones who do.”

-Steve Jobs

Questions?

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