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

August 11, 2021

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

commonfund.nih.gov
To enhance health, lengthen life, and reduce illness and disability
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

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

- **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:

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

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)

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
High-Risk, High-Reward Research Program

Annual funding opportunities
High-Risk, High-Reward Research Program

High-risk, high-impact ideas
High-Risk, High-Reward Research Program

No preliminary data required
High-Risk, High-Reward Research Program

Any topic relevant to NIH mission
High-Risk, High-Reward Research Program

Chair
James M. Anderson, MD, PhD
OD

Program Leader
Ravi Basavappa, PhD
OSC/DPCPSI/OD

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High-Risk, High-Reward Research Program

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

RFA-RM-21-015
Due September 10, 2021
# Pioneer Award

## Application – DP1

<table>
<thead>
<tr>
<th></th>
<th>R01</th>
<th>Pioneer Award</th>
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</thead>
</table>
| **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

Applications Received → Phase I Mail review → FIRST LEVEL REVIEW

Phase II (Editorial Panel)
1. Panel reviews & selects subset
2. Panel interviews subset & discusses
3. Panel scores

SECOND LEVEL REVIEW → Council Approval
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

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

RFA-RM-21-016
Due August 20, 2021
## New Innovator Award

### Application – DP2

<table>
<thead>
<tr>
<th>Research Strategy Essay</th>
<th>10 pages:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Scientific problem, significance, and potential impact</td>
</tr>
<tr>
<td></td>
<td>• Innovativeness of approach</td>
</tr>
<tr>
<td></td>
<td>• How risks and challenges will be addressed</td>
</tr>
<tr>
<td></td>
<td>• Suitability for award</td>
</tr>
<tr>
<td></td>
<td>• Investigator’s qualifications</td>
</tr>
</tbody>
</table>

| 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

Applications Received

Phase I
Mail review

FIRST LEVEL REVIEW

Phase II (Editorial Panel)
1. Panel selects subset
2. Panel reviews & discusses
3. Panel scores

SECOND LEVEL REVIEW

Council Approval
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
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

NIH DIRECTOR'S
TRANSFORMATIVE RESEARCH AWARD

RFA-RM-21-017
Due September 1, 2021
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
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

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

RFA-RM-21-018
Due September 3, 2021
## Application – DP5

<table>
<thead>
<tr>
<th>Application Limit</th>
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<tbody>
<tr>
<td>Research Strategy Essay</td>
<td>12 pages:</td>
</tr>
<tr>
<td></td>
<td>• Scientific challenge and significance</td>
</tr>
<tr>
<td></td>
<td>• Innovativeness of approach</td>
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<tr>
<td></td>
<td>• Investigator’s qualifications</td>
</tr>
<tr>
<td></td>
<td>• Plans for development</td>
</tr>
<tr>
<td>Facilities &amp; Other Resources</td>
<td>Institutional support detailed</td>
</tr>
<tr>
<td>Budget Information</td>
<td>Modular budget</td>
</tr>
<tr>
<td>Letters of Support</td>
<td>Should be included</td>
</tr>
<tr>
<td>Research Effort</td>
<td>80% for first 2 years</td>
</tr>
<tr>
<td>Letters of Reference</td>
<td>3-5 required</td>
</tr>
</tbody>
</table>
Early Independence Award

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
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
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!

High-Risk, High-Reward Research Symposium

June 8-10, 2022
The Bethesda Hotel, Bethesda, MD

NIH Director’s Pioneer Award
NIH Director’s New Innovator Award
NIH Director’s Transformative Research Award
NIH Director’s Early Independence Award
“The people who are crazy enough to think they can change the world are the ones who do.”

-Steve Jobs
High-Risk, High-Reward Research Program

Questions?

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PioneerAwards@mail.nih.gov
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