The Next Generation Researchers Initiative

81st Meeting of the National Advisory Council for Human Genome Research

September 11, 2017
Good Stewardship is Essential to NIH

NIH-Wide Strategic Plan
Fiscal Years 2016-2020

Enhance Stewardship
- Recruit/retain outstanding research workforce
- Enhance workforce diversity
- Encourage innovation
- Optimize approaches to inform funding decisions
- Enhance impact through partnerships
- Ensure rigor and reproducibility
- Reduce administrative burden
The long-held but erroneous assumption of never-ending rapid growth in biomedical science has created an unsustainable hypercompetitive system that is discouraging even the most outstanding students from entering our profession... This is a recipe for long-term decline... It is time to confront the dangers at hand and rethink some fundamental features of the US biomedical research system.
What Young Scientists Are Saying

SUFFERING IN SCIENCE

We asked young scientists to tell us their concerns. This is what they said.

- Desperate pursuit of grants
- No time for science
- Extreme competition ... to cut corners
- Dependence on senior scientists
- Administrative overload ... No help
- Long hours

*Nature* 2016;538:446-9
Hypercompetition: Applicants and Awardees for NIH RPGs

![Graph showing the number of applicants and awardees over fiscal years from 2003 to 2015. The number of applicants is represented by a teal triangle line, increasing steadily. The number of awardees is represented by a red circle line, fluctuating slightly but maintaining a steady level.](image-url)
“The average age at which the lucky few actually get a grant has steadily increased — it is now 42, up from 35 in 1980, which means biomedical scientists in academia are essentially apprentices until middle age. And the tendency is for the grants to go to scientists who already have them, making it harder and harder to break into the system.”

https://www.nytimes.com/2016/07/14/upshot/so-many-research-scientists-so-few-openings-as-professors.html?_r=0
Age of Investigators Funded by NIH

Not solely due to Baby Boom demographics

Multiple analyses indicate established PIs are “outcompeting” other groups due to increased resiliency.

OER SARB
Getting a Grant Is Harder Than Renewing a Grant

Success Rates over Time

NIH Doubling

Fiscal Year


Success Rate (%)
NIH Can’t Afford to Support Everything: Good Stewardship is Essential

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Directs NIH Director to promote policies that will promote **earlier independence and increased funding** for new investigators.

404M. **Next generation of researchers** (a) Next Generation of Researchers Initiative - *There shall be established within the Office of the Director of the National Institutes of Health, the **Next Generation of Researchers Initiative** (referred to in this section as the “Initiative”), through which the Director shall coordinate all policies and programs within the National Institutes of Health that are focused on promoting and providing opportunities for new researchers and earlier research independence.*
Policy Supporting the Next Generation Researchers Initiative

Notice Number: NOT-OD-17-101

Key Dates
Release Date: August 31, 2017
Implementation Date: August 31, 2017

Related Announcements
NOT-OD-08-121 - Rescinded
NOT-OD-09-013 - Rescinded
NOT-OD-09-134 - Rescinded

Issued by
National Institutes of Health (NIH)

Purpose
This notice announces a new policy designed to invest in the next generation of researchers; this policy implements, in part, Section 2021 of the 21st Century Cures Act. This policy supersedes previous notices on new and early stage investigators (NOT-OD-08-121, NOT-OD-09-013 and NOT-OD-09-134).

How Do We Increase the Number of Early-Career Funded Scientists?

- Enhance the prioritization of Early Stage Investigators (ESIs)
  - ESI is a Program Director / Principal Investigator (PD/PI) who has completed their terminal research degree or end of post-graduate clinical training, whichever date is later, within the past 10 years and who has not previously competed successfully as PD/PI for a substantial NIH independent research award
  - Goal for FY 2017: fund approximately 200 more ESI awards than in FY 2016
How Do We Stabilize the Career Trajectories of Scientists?

- Enhance the prioritization of Early Established Investigators (EEIs)
  - EEI is a PD/PI who is within 10 years of receiving their first substantial, independent competing NIH R01-equivalent research award as an ESI.
  - A meritorious application with a designated PD/PI EEI may be prioritized for funding if:
    - The EEI lost or is at risk for losing all NIH research support if not funded by competing awards this year, OR
    - The EEI is supported by only one active award
  - Goal for FY 2017: achieve an overall opportunity for funding 200 more EEIs across the NIH than in FY 2016
Assessing Impact of NIH Research: Developing Metrics of Productivity

- **Long term:** Assess the value of our investments by measuring outcomes such as:
  - Disruptions in prevailing paradigms
  - Patents/licenses
  - New technologies
  - New medical interventions
  - Changes to medical practice
  - Improvements in public health
Assessing Impact of NIH Research: Developing Metrics of Productivity

- But good stewardship also requires ways to assess impact in a less extended time frame
  - Need a reliable approach to measure the interim influence of NIH funding
- For a **short-term** assessment, we would need a:
  - Validated metrics for output (productivity)
  - Metrics for grant support that are not based on dollars, but on commitment
    - e.g., clinical research is more costly than most basic research
NIH Tools to Assess Influence of Publications

- **Relative Citation Ratio (RCR):** time-independent, field-normalized metric that measures influence of publications in PubMed
  - Validated by thorough analysis – includes strong correlation with opinions of experts on the impact of papers in their fields
- **iCite:** dashboard of bibliometrics for publications selected by the user range of years, article type, etc.
  - Displays articles per year, citations per year, and RCRs
- Additional approaches must be considered

[https://icite.od.nih.gov](https://icite.od.nih.gov)
Considerations

- Where will the funds come from?
  - Reprioritization of funds
  - Some ICs use the R56
  - Some ICs use the R35; for example:
    - NIGMS: Maximizing Investigators' Research Award (MIRA)
    - NIDCR: Sustaining Outstanding Achievement in Research (SOAR) Award
    - NIAMS: Supplements to Advance Research (STAR) from Projects to Programs

- Monitoring
  - Workforce size and diversity
  - Scientific excellence and outcome
  - IC funding decisions
Stakeholder Feedback:
ACD Next Gen Researchers Working Group

- NIH has established a working group of the Advisory Committee to the Director to refine and implement the initiative.
  - Consists of investigators at all levels – from graduate student to full professor
- Charge:
  - Develop goals and implementation strategies
  - Identify productivity measures
  - Recommend methods to track policy impact
- NIH will use public meetings, conferences, and the Next Gen public website to communicate progress to the community
- For more information, visit: https://grants.nih.gov/ngri.htm
Stakeholder Feedback: We Heard You

Open Mike

Helping connect you with the NIH perspective, and helping connect us with yours

NIH’s Next Generation Researchers Initiative
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